U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Safety Management Systems for Aviation Service Providers

Date: xx/xx/10

AC No: 120-92NPRM

Initiated by: AFS-900

Change:

Note: This draft Advisory Circular is being provided by the FAA Flight Standards SMS Program Office to support evaluation of the Safety Management System for Part 121 Air Carriers Notice of Proposed Rulemaking (NPRM) (RIN No. 2120-AJ86). This draft is not intended to provide guidance for compliance with any current existing regulation or policy. This draft Advisory Circular provides proposed guidance on possible implementation of a proposed SMS rule. As such, it is written as if the NPRM has been accepted as a SMS rule and will be revised as necessary as rulemaking considerations proceed. For this reason, the FAA welcomes comment on this document.

1. PURPOSE. This advisory circular (AC) provides a Framework for Safety Management System (SMS) development by certificate holders. It contains a uniform set of expectations that align with the structure and format of the International Civil Aviation Organization (ICAO) Framework; and Aviation Safety (AVS) policy in Federal Aviation Administration (FAA) Order VS 8000.367, AVS Safety Management System Requirements, Appendix B and Title 14 CFR Part 5.

Regulatory Requirement: Title 14 of the Code of Federal Regulations (14 CFR part 5), §5.1 requires a part 121 certificate holder to have a safety management system that meets the requirements of part 5 and is acceptable to the Administrator.

2. APPLICABILITY.

a. Developing an SMS. This AC applies to both certificated and non-certificated aviation service providers (and organizations) that desire to develop and implement an SMS. Air carriers conducting operations under 14 CFR part 121 are required to develop and implement an SMS in accordance with 14 CFR part 5. Development and implementation of an SMS by other type of aviation service providers is currently voluntary. While the FAA encourages SMS implementation, these systems are not substitutes for compliance with Federal regulations and must be developed , implemented and maintained to comply with all legal, regulatory and statutory requirements. For aviation service providers that elect to voluntarily implement an SMS, the FAA views the objectives and expectations in Appendix 1 to this AC to be the minimum for a comprehensive and robust SMS.

b. FAA SMS Framework. The FAA SMS Framework is written as a functional expectations document. It stresses *what* the organization must do to implement a robust SMS rather than *how*

it will be accomplished. At the same time, the FAA SMS Framework needs to be applicable to a wide variety of types and sizes of operators. Therefore, it is designed to be scalable and allow operators to integrate safety management practices into their unique business models.

3. RELATED READING MATERIAL. The following references, current editions, may be of value to users of this AC, as they develop their SMS:

- Title 14 CFR, Part 5 Safety Management System
- Annex 6 to the Convention on International Civil Aviation, Part 1, International Commercial Air Transport, Aeroplanes (with amendment 33).
- International Civil Aviation Organization (ICAO) Document 9859, ICAO Safety Management Manual (SMM, Second Edition, 2009).
- FAA Order 8000.369, Safety Management System Guidance.
- FAA Order VS 8000.367, Aviation Safety (AVS) Safety Management System Requirements.
- AC 120-59, Air Carrier Internal Evaluation Programs (IEP).
- AC 120-66, Aviation Safety Action Programs (ASAP).
- AC 120-79, Developing and Implementing a Continuing Analysis and Surveillance System (CASS).
- AC 120-82, Flight Operational Quality Assurance (FOQA).

4. BACKGROUND. The modern aviation system is characterized by increasingly diverse and complex networks of business/governmental organizations as well as increasingly advanced aircraft and equipment. The rapidly changing aviation operational environment requires these organizations to adapt continuously to maintain their viability and relevance.

a. SMS and System Safety. Systems can be described in terms of integrated networks of people and other resources performing activities that accomplish some mission or goal in a prescribed environment. Management of the system's activities involves planning, organizing, directing, and controlling these assets toward the organization's goals. Factors related to the processes themselves – the "things people do," the resources that they use to perform the processes' underlying tasks and activities, and the conditions in which they work can all affect safety performance. All of these factors affect how the system and its underlying processes must be designed and how they will operate. They can be constraints and assets and they can be the basis of the conditions that become hazards. Therefore, it is essential that both the carrier's management and the certificate management team carefully examine processes, system elements, and the operational environment to assure robust system design and performance that assures continuing operational safety.

b. Processes Attributes. Several important characteristics of a process are known as process attributes or safety attributes[1] when they are applied to safety related operational and support processes. These process attributes must have safety requirements built into their design if they are to result in improved safety outcomes. The attributes include:

(1) *Responsibility* and *authority* for accomplishment of required activities,

(2) *Procedures* to provide clear instructions for the members of the organization to follow,

(3) *Controls* which provide organizational and supervisory controls on the activities involved in processes to ensure they produce the correct outputs,

(4) *Measures* of both the processes and their products, and

(5) *Interfaces* are a critical aspect of system management; recognizing the important interrelationships between processes and activities within the company as well as with contractors, vendors, customers, and other organizations with which the company does business.

c. Systems Analysis of processes and their associated attributes answer the questions; "what do the people do?" and "how do they do it?" The system design must also answer the questions; "what do they do it with?" and "what conditions to they work under?" These can be viewed as resources for process performance. The system includes:

(1) Facilities,

(2) Hardware,

(3) Software,

(4) Personnel, and

(5) Organization.

d. Operational Environments. The environment includes not only the physical environment (e.g. terrain, weather, geographic location, etc.) but also the political, cultural, demographic, and financial environment that the carrier works in. The environment will also include such things as local laws, labor agreements, resource costs, contractual agreements, and consumer issues such as the price that the operator's customer base is willing to pay for products or services.

e. Management Involvement: The SMS specifies that senior management officials, starting with the accountable executive, are primarily responsible for SMS operation and they

[1] These six characteristics of systems, *responsibility, authority, procedures, controls, process measures*, and *interfaces*, are called safety attributes in the FAA's Air Transportation Oversight System (ATOS).

must be personally and materially involved in safety activities. They must clearly delineate safety responsibilities throughout the organization. While it is true that management must take overall responsibility for safe operations, it is also true that all members of the organization must know their responsibilities to identify and report hazards in their work environment, as well as notifying other workers of the identified hazard.

f. Safety Culture. The Human Aspect of Organizations. "An organization's culture consists of its values, beliefs, legends, rituals, mission goals, performance measures, and sense of responsibility to its employees, customers, and the community.[2]" The principles or attributes discussed above, that make up the SMS functions, will not achieve their goals unless the people that comprise the organization function together in a manner that promotes safe operations. The organizational aspect that is related to safety is frequently called the *safety culture*. The safety culture consists of psychological (how people think and feel), behavioral (how people and groups act and perform), and organizational or systematic (the programs, procedures, and organization of the enterprise) elements. The organizational/systematic elements are the things that are most under management control, the other two elements being outcomes of those efforts and other influences. For this reason, the FAA SMS Framework in Appendix 1 of this AC includes requirements for policies that will provide the structure for the SMS and requirements for organizational functions. These functions include an effective employee safety reporting system and clear lines of communication both up and down the organizational chain regarding safety matters.

5. THE FAA SMS FRAMEWORK: INTRODUCTION.

a. The Need for SMS.

(1) FAA Standardization. The FAA Associate Administrator for Aviation Safety is interested in developing an integrated functional SMS in which business and governmental roles and relationships are well defined, expectations are based upon sound systems engineering and system safety principles, and both regulators and regulated industries participate in a unified safety effort. The FAA SMS Framework in Appendix 1 provides the functional requirements to that end (development of aviation service provider's SMS).

(2) ICAO SMS Requirements and the FAA. The ICAO, in documents, manuals, and amendments[3] for key annexes to the ICAO Conventions, has revamped its standards and recommended practices (SARPs) to reflect a systems approach to safety management. This coincides with the FAA's move toward a systems approach for oversight over the past several years. Because of the many diverse relationships between organizations and the global nature of the aviation system, it is critical that the functions of an SMS be harmonized to the point that there is a common recognition of the meaning of SMS among all concerned, both domestically and internationally. Amendment 33 to ICAO Annex 6 introduced a 12-element ICAO SMS

[2] Manuele, Fred A. On the Practice of Safety. John Wiley & Sons, 2003, Hoboken, NJ.

[3] International Civil Aviation Organization (ICAO) Document 9734, Safety Oversight Manual; ICAO Document 9859, Safety Management Manual, 2nd Edition, 2009; and ICAO Annex 6, Part 1 International Commercial Air Transport – Aeroplanes with Amendment 33.

Framework, which is reproduced below. The FAA SMS Framework in Appendix 1 is aligned with the ICAO SMS Framework; however the FAA SMS Framework provides additional details to facilitate a certificate holder's implementation of an SMS. Title 14 CFR, part 5, establishes the regulatory requirements for SMS and provides the structure for the SMS Framework.

TABLE 1. ICAO ANNEX 6, APPENDIX 7, FRAMEWORK FOR SAFETY MANAGEMENT SYSTEMS

1. Safety policy and objectives	
	1.1 – Management commitment and responsibility
	1.2 – Safety accountabilities
	1.3 – Appointment of key safety personnel
	1.4 – Coordination of emergency response planning
	1.5 – SMS documentation
2. Safety risk management	
	2.1 – Hazard identification
	2.2 – Safety risk assessment and mitigation
3. Safety assurance	
	3.1 – Safety performance monitoring and measurement
	3.2 – The management of change
	3.3 – Continuous improvement of the SMS
4. Safety promotion	
	4.1 – Training and education
	4.2 – Safety communication

b. Functional Expectations. The FAA SMS Framework (contained in Appendix 1 of this AC) is designed to provide definitive functional objectives and expectations that are compatible with auditing by the organization's own personnel, regulators, or other third-party consultants. SMS regulatory requirements and the performance objectives and design expectations in this AC are intended to be performance based. That is, they stress "what" is expected in a robust SMS rather than "how" these requirements and objectives are accomplished. To the maximum extent possible, each indexed statement defines a single expectation so that system auditors can easily use it.

c. Regulatory Requirements for part 121 Air Carriers. Air Carriers that conduct operations under 14 CFR part 121 are required to develop and implement an SMS in accordance with 14 CFR part 5. Part 5 was designed to closely parallel the ICAO SMS framework. Table 2 provides a cross reference between the ICAO SMS Framework, the SMS system components, elements, and processes outlined in Appendix 1 of this AC, and the requirements of part 5.

Table 2 Cross Reference Matrix

ICAO to AC 120-92NPRM to Part 5 NPRM Draft

ICAO SMS Framework	**AC 120-92NPRM (App 1)**	**Part 5 - NPRM Draft**
Component 1. Safety policy and objectives	***Component 1.0 Safety Policy and Objectives***	***Subpart B – Safety Policy***
Element 1.1 Management commitment and responsibility	Element 1.1 Safety Policy	§5.21 Safety Policy.
Element 1.2 Safety accountabilities	Element 1.2 Management Commitment and Safety Accountabilities	§5.23 Safety accountability and authority.
Element 1.3 Appointment of key safety personnel	Element 1.3 Key Safety Personnel	§5.25 Designation and responsibilities of required safety management personnel.
Element 1.4 Coordination of emergency response planning	Element 1.4 Emergency Preparedness and Response	§5.27 Coordination of emergency response planning.
Element 1.5 SMS documentation	Element 1.5 SMS Documentation and Records	Subpart F - SMS Documentation and Recordkeeping §5.95 SMS documentation. §5.97 SMS records.
Component 2. Safety risk management	**Component 2.0 Safety Risk Management** General Design Expectations	**Subpart C – Safety Risk Management** §5.51 Applicability.
Element 2.1 Hazard identification	Element 2.1 Hazard Identification and Analysis	§5.53 System analysis and hazard identification.
	Process 2.1.1 System Description and Task	§5.53 (a) & (b).

ICAO SMS Framework	AC 120-92NPRM (App 1)	Part 5 - NPRM Draft
	Analysis	
	Process 2.1.2 Identify Hazards	§5.53 (c)
Element 2.2 Risk assessment and mitigation	Element 2.2 Risk Assessment and Control	§5.55 Safety risk assessment and control.
	Process 2.2.1 Analyze Safety Risk	§5.55 (a).
	Process 2.2.2 Assess Safety Risk	§5.55 (b).
	Process 2.2.3 Control/Mitigate Safety Risk	§5.55 (c).
Component 3. Safety assurance	**Component 3.0 Safety Assurance**	**Subpart D – Safety Assurance**
Element 3.1 Safety performance monitoring and measurement	Element 3.1 Safety Performance Monitoring and Measurement	§5.71 Safety performance monitoring and measurement.
	Process 3.1.1 Continuous Monitoring	§5.71 (a) (1).
	Process 3.1.2 Internal Audits by Operational Departments	§5.71 (a) (2).
	Process 3.1.3 Internal Evaluation	§5.71 (a) (4).
	Process 3.1.4 External Auditing of the SMS	§5.71 (a) (2).
	Process 3.1.5 Investigation	§5.71 (a) (5).
	Process 3.1.6 Employee Reporting and Feedback System	§5.71 (a) (7).
	Process 3.1.7 Analysis of	§5.71 (b).

ICAO SMS Framework	AC 120-92NPRM (App 1)	Part 5 - NPRM Draft
	Data	
	Process 3.1.8 System Assessment	§5.73 Safety Performance Assessment.
Element 3.2 The management of change	Element 3.2 Management of Change	§5.51 Applicability. §5.73 (a) (4) & (5), 5.73 (b) Performance Assessment
Element 3.3 Continuous improvement of the SMS	Element 3.3 Continuous Improvement	§5.75 Continuous improvement.
	Process 3.3.1 Preventive/Corrective Action	§5.75 Continuous improvement.
	Process 3.3.2 Management Review	§5.25 Designation and responsibilities of required safety management personnel.
Component 4. Safety promotion	**Component 4.0 Safety Promotion**	**Subpart E – Safety Promotion**
Element 4.1 Training and education	Element 4.1 Competencies and Training	§5.91 Competencies and Training.
	Process 4.1.1 Personnel Expectations (Competence)	§5.91 Competencies and Training.
	Process 4.1.2 Training	§5.91 Competencies and Training.
Element 4.2 Safety communication	Element 4.2 Communication and Awareness	§5.93 Safety communication.

(1) Process Approach. As stated above, the FAA SMS Framework is written as a functional expectations document. It stresses *what* the organization must do rather than *how* it will be accomplished. This is important to the FAA and service providers alike. The FAA feels that each of the SMS processes detailed in the FAA SMS Framework is essential for a comprehensive SMS. At the same time, the FAA SMS Framework needs to be applicable to a

wide variety of types and sizes of operators. This was a reason for using a similar scope, scale, and language to the International Organization for Standardization (ISO) standards, which also are designed for broad application. Therefore, the FAA SMS Framework is designed to be scalable to allow operators to integrate safety management practices into their unique business models. Operators are not expected to configure their systems in the format of the FAA SMS Framework or to duplicate existing programs that accomplish the same function, however existing programs should be traceable to identify the areas where organizational activities satisfy framework requirements. The FAA SMS Framework document in Appendix 1, attempts to balance flexibility of implementation and standardization of essential safety management processes.

(2) Scalability. The SMS functions do not need to be extensive or complex to be effective. Smaller organizations may use a paper log to document safety issues and a paper system or simple spreadsheet or word processor files to track them to resolution. Internal evaluation and management reviews may consist of periodic conferences between business owners or top management and other employees to review information and track progress toward resolution. This can be done whether the organization operates under 14 CFR parts 91, 121, 135, public use, etc. A larger organization may need more sophisticated resources such as web-based data systems and trained safety personnel to manage the details and a more formal committee system to accomplish the same functions. While sophisticated process development tools and methods are available, simple brainstorming sessions with managers, supervisors, and other employees are often most effective. In smaller organizations, the president, Chief Executive Officer (CEO) or owner may elect to conduct internal audits and internal evaluation functions themselves, in conjunction with the management review function. Likewise, in very small organizations the owner/operator may elect to conduct internal audits, continuous monitoring, document reviews, safety risk analysis/assessment and training review either personally or in conjunction with co-owners, managers, supervisors, or employees.

d. Integration of Existing Programs. All part 121 air carriers and those part 135 air carriers operating airplanes with more than 10 passenger seats, have Continuing Analysis and Surveillance Systems (CASS). Additionally many air carriers of both types have Internal Evaluation Programs (IEPs) to satisfy Department of Defense contractual requirements. Many carriers also have other voluntary programs that satisfy SMS functions. Carriers are encouraged to consider these programs wherever they are appropriate to their operations and include them in SMS planning. These programs include: Aviation Safety Action Programs (ASAP), Flight Operational Quality Assurance (FOQA) and Line Oriented Safety Audit (LOSA) programs. Each of these programs includes some of the processes of the SMS. It is not the intent of the FAA to require duplicative programs where the functions of SMS components, elements, or processes are already being accomplished though any of the above mentioned programs or any other programs or processes that they carrier may have in place. To the contrary, the SMS is intended to be performance based and stresses a comprehensive, integrated approach to safety management. Detailed information on integrating regulatory and voluntary programs into the SMS can be found in Appendix 6. The gap analysis that is part of the SMS implementation process provides a means of mapping the characteristics of existing programs against SMS requirements and expectations.

6. FOUR COMPONENTS (PILLARS) OF SAFETY MANAGEMENT. The FAA SMS Framework is organized around four building blocks of safety management. These four components or *pillars* are essential for a safety-oriented management system. They follow the ICAO Annex 6, SMS Framework and Title 14 CFR, part 5.

a. Policy. All management systems must define policies, procedures, and organizational structures to accomplish their goals. Component 1 in the FAA SMS Framework outlines expectations for these elements, which in turn provide the foundations for SMS functional elements.

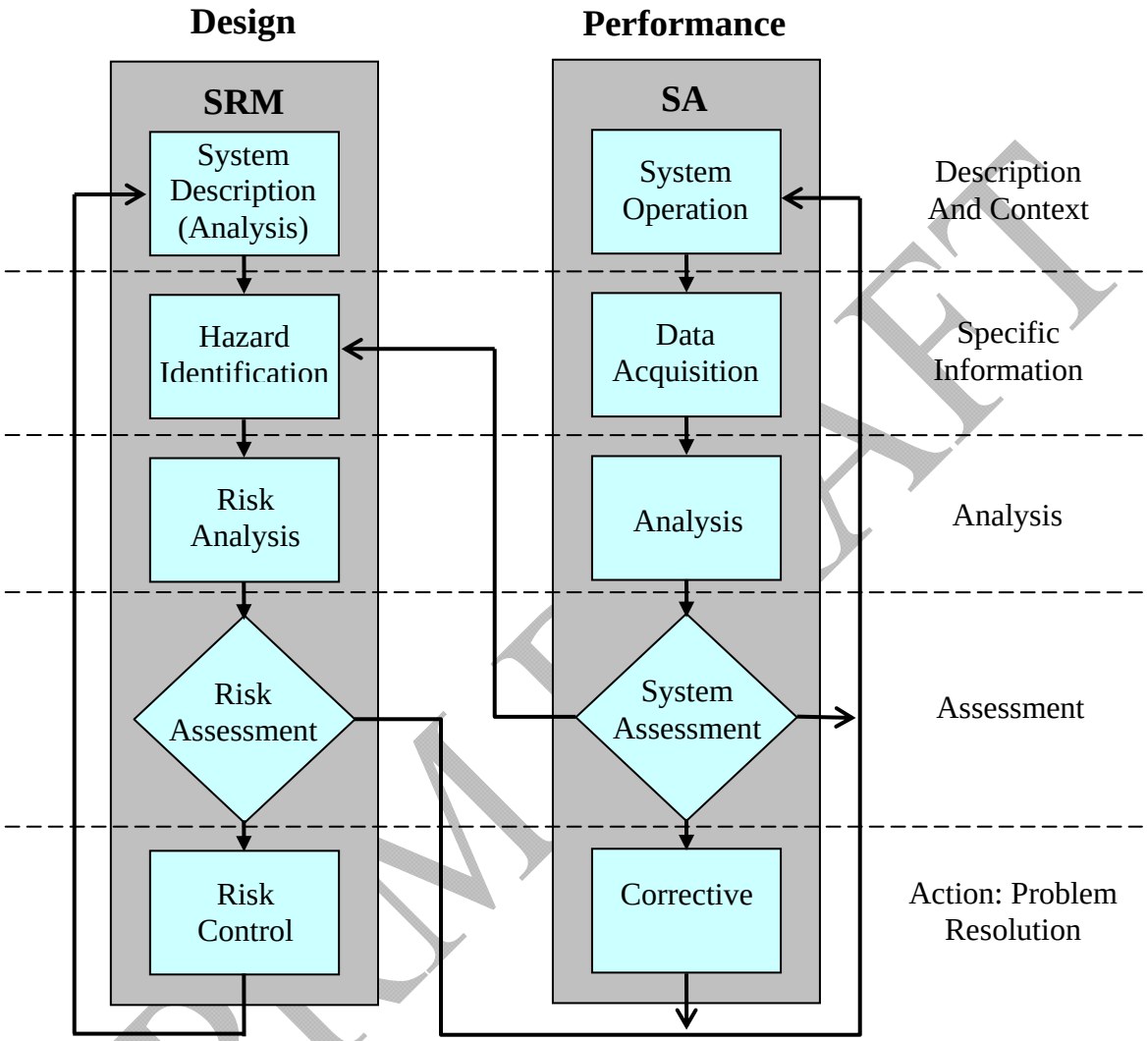
b. Safety Risk Management (SRM). Safety Risk Management, (Component 2), is essential in controlling risk to acceptable levels. It provides a formal system of hazard identification is based upon the system safety process model that is used in FAA Order VS 8000.367, Appendix B and complies with 14 CFR part 5.

c. Safety Assurance (SA). Once SRM controls (sometimes termed *mitigations*) are identified and operational, the operator must ensure the controls continue to be effective in a changing environment. Safety Assurance, (Component 3), provides for this, using system safety and quality management concepts and processes.

d. Safety Promotion. The operator must promote safety as a core value with practices that support a sound safety culture. This fourth component provides guidance for setting up these functions.

> **NOTE:** Figure 1, on the following page, shows how the SRM and SA functions relate to each other. The SRM function (design) provides for initial identification of hazards and assessment of risk. Organizational risk controls are developed and once they are determined to be capable of bringing the risk to an acceptable level, they are employed operationally. The SA function (performance) takes over at this point to ensure that the risk controls are being practiced and they continue to achieve their intended objectives. The SA function also provides for assessment of the need for new controls because of changes in the operational environment.

FIGURE 1. SAFETY RISK MANAGEMENT AND SAFETY ASSURANCE PROCESSES



7. THE FAA SMS FRAMEWORK.

a. General Organization of the FAA SMS Framework. The FAA SMS Framework aligns with the structure and format of ICAO Annex 6 to the Convention on International Civil Aviation, *Operation of Aircraft* and the ICAO SMS Framework contained in Document 9859, Chapter 8; incorporates the requirements of Title 14 Combined Federal Regulations Part 5, FAA Order VS 8000.367 and follows the principles of a Quality Management System (QMS) in accordance with ISO standards. The first part of the SMS functional expectations included as Appendix 1 follows the general organization of ISO 9000-2000 and ISO 14001. The first three sections describe scope and applicability, references, and definitions. The fourth section addresses each of the four components of SMS, as described below. The components are further

defined in terms of elements and processes, each containing respective performance objectives and design expectations:

b. Policy. Setting the Foundation (Appendix 1, Component 1.0; Part 5, Subpart B).

(1) Importance of Top Management Involvement. (Appendix 1, Component 1.0, Element 1.1 and 1.2; §5.21 §5.23 §5.25) Part 5 and the FAA SMS Framework specify that the acountable executive and all members of management are primarily responsible for safety management. Managers must plan, organize, direct, and control employees' activities and allocate resources to make safety controls effective. Management involvement must start with the accountable executive, the most senior management official in the company with the authority to direct operations and allocate resources. A key factor in both safety and quality management is management's personal and material involvement in quality and safety activities, including active, personal involvement of the accountable executive. The FAA SMS Framework also specifies that management must clearly delineate safety responsibilities throughout the organization. While it is true that the accountable executive and other senior managers must take overall responsibility for safe operations, it is also true that all members of an organization must know their responsibilities and be both empowered and involved with respect to safety.

(2) Designation of an Accountable Executive. Pursuant to §5.25 (a), organizations are required to appoint an accountable executive. The accountable executive is an individual identified by the certificate holder as the one who directs and controls an organization at the highest level and has full responsibility for the organization's compliance with regulatory standards in chapter I of Title 14 of the Code of Federal Regulations. This person has final authority over operations authorized to be conducted; controls both the financial and human resources required for the operations to be conducted; and retains ultimate responsibility for the safety performance of the operations conducted under the operator's certificate. Appendix 5 contains information to assist in selection and designation of an appropriate accountable executive.

(3) Responsibilities of the Accountable Executive. The accountable executive must ensure that hazard identification and safety risk analysis are properly implemented and performing in all areas of the certificate holder's organization. He/she is responsible for monitoring the effectiveness of safety risk controls and ensures safety promotion throughout the certificate holder's organization. He/she must regularly report to the accountable executive on the performance of the SMS and on any need for improvement.

(4) Management Personnel Requirements and Responsibilities. 14 CFR §119.65 *Management Personnel Required for Operations Conducted Under Part 121…*, specifies that a part 121 certificate holder must have (§119.65(a)), "sufficient qualified management and technical personnel to ensure the highest degree of safety in its operations." §135.69 has similar requirements for part 135 operators. Five specific management positions (three for part 135) are specified in the section of the CFRs. §119.65(d) (3) goes on to state that these management personnel will. "Discharge their duties to meet applicable legal requirements and to maintain safe operations." Further, the paragraph indicates that the individuals in the specified five positions and "anyone in a position to exercise **control over operations** conducted under the operating certificate," must meet these part119 requirements. The certificate holder's SMS documentation

should define the specific expectations and responsibilities for each of these managers. They should also define expectations and responsibilities for other managers, supervisory personnel, and individual employees who are entrusted with responsibilities for "control over operations."

(5) Management Personnel in the SMS. The SMS will provide managers with a structured system with which to meet safety objectives. This is particularly true with respect to risk assessment. "Assessment" implies a decision process and should, therefore, be accomplished by managers with the authority to make major operational decisions. Therefore, the certificate holder should apply part 5 standards, at a minimum, to the individuals filling the positions specified in §119.65, and those in a "position to exercise control over operations conducted under the operating certificate". Under §119.65, safety management personnel include:

- Director of Operations
- Director of Maintenance
- Chief Inspector
- Chief Pilot
- Director of Safety

(6) Acceptable Versus. Unacceptable behavior: Management should define, in the organization's safety policy, the line between acceptable behavior (often unintended errors) and unacceptable behaviors (such as negligence, recklessness, violations or sabotage) and provide fair protection to reporters. A safety or just culture may not preclude the "criminalization of error", which is legally, ethically and morally within the rights of any organization. Potential litigation may be expected following an accident or serious incident even if no negligence or ill-intent existed. A potential issue could therefore exist if voluntary hazard reports are treated in the same way as those concerning accident and serious incident investigations. The intent of protecting hazard reports should not challenge the legitimacy of a judicial investigation or demand undue immunity. The following examples are derived from FAA Order 8900.1, Volume 14, Section 8, Enforcement Decision Process.

(a) Examples of human errors:

• A mechanic improperly performs maintenance because he or she misreads an instruction in the maintenance manual has acted inadvertently.
• An air carrier who operates an aircraft with an improperly deferred component because of genuine miscommunication with maintenance control has acted inadvertently (e.g., the maintenance controller misheard the discrepancy reported).
• A pilot misses a checklist item because of an air traffic control communication.

(b) Examples of unacceptable behavior:

• A mechanic failing to consult the maintenance manual and then conducts an incomplete or improper inspection or improperly performs maintenance.
• An air carrier who operates an aircraft with an improperly deferred component because the maintenance controller failed to follow documented procedures or

ignored them (e.g., the maintenance controller disregarded the discrepancy reported).
• A pilot fails to use a required checklist.
• A Commercial rated pilot taking off at a busy controlled airport without having received takeoff clearance.
• A maintenance controller instructs a line mechanic to defer a discrepancy using a specific minimum equipment list item number with knowledge that the system or component deferred is not inoperative.
• Known and substantiated lack of qualification, or questionable qualification. For example:
1) Positive drug and alcohol test results.
2) Failing to successfully complete a reexamination.
3) Failing to possess the skills and competency required for the certificate held.
4) Refusing to permit and/or submit to an inspection, reexamination, or a drug or alcohol test.
5) Intentionally falsifying a record or application.
6) Cheating on a written examination.
• Criminal activity, such as narcotics convictions, substance abuse, controlled substances or alcohol abuse.
• Operating without having been issued a required certificate, rating, or other required and valid authorization, such as a 14 CFR §61.58 pilot in command proficiency check.

(7) The Three Rs of Safety Management: **Roles, Responsibilities, and Relationships.** There is a relationship between the *productive* processes of the certificate holder as well as the joint *protective* processes of the regulator (FAA oversight) and the certificate holder's SMS (SMS SA). On the *production* side, the operator has a role to provide a ***useful*** service or product. On the *protection* side (operator's SMS), they have a role to provide a ***safe*** service or product. The FAA's oversight role is to assure that the operator lives up to it statutory safety responsibilities. One of the principal roles of the oversight system is to establish risk controls in the form of regulations, standards, and policies. It follows that regulatory compliance, in a manner that accomplishes the regulations' safety objectives, is also part of the certificate holder's role in safety management. It is the objective of the SMS concept to combine system safety based oversight systems and operator's SMS's into a cooperative, professional relationship, within the context of those roles.

(8) Procedures and Controls. (Appendix 1, Component 1.0) Two key attributes of systems are procedures and controls. Policies must be translated into procedures in order for them to be applied and organizational controls must be in place to ensure that critical steps are accomplished as designed. Organizations must develop, document, and maintain procedures to carry out their safety policies and objectives. Moreover, supervisory controls must be used to monitor the accomplishment of the procedures and ensure that employees understand their safety roles.

(9) Safety and Quality: Striking a Balance. (Appendix 1, Component 1.0) As discussed above, the FAA SMS Framework uses quality management principles, but it is the expectation that operators will manage their system based on an objective assessment of safety risk, at the same level as customer satisfaction with products or other conventional commercial goals. The management of process quality, with emphasis on characteristics of those processes that affect safety, is an important aspect of safety management. The FAA SMS Framework specifies that the certificate holder should prescribe both safety and quality policies. The coverage of quality policies is limited in scope to quality in support of safety, although operators are encouraged to integrate their management systems as much as feasible. Safety objectives should be predominant where conflicts are identified.

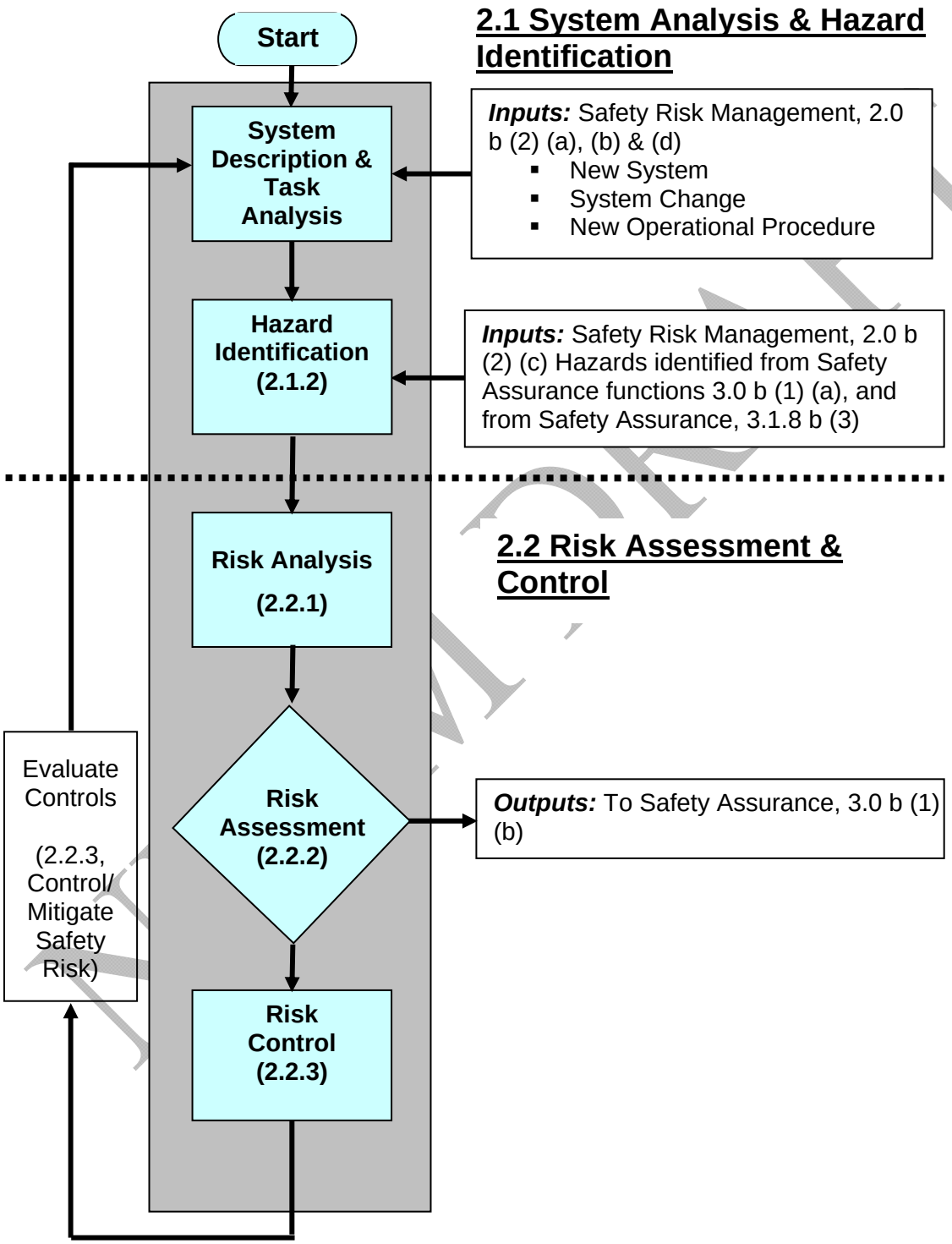
c. Safety Risk Management. Setting Expectations for Safety Risk Management (Appendix 1, Component 2.0; Part 5, Subpart C). The SRM process is used to examine the operational functions of the company and their operational environment to identify hazards and to analyze associated risk. The intent of the SRM process is to focus on the areas of greatest risk from a safety perspective, taking into account complexity, operational scope, etc.

(1) Management Responsibilities in SRM. §5.23 (a) (2) of the SMS rule defines specific responsibilities for management personnel within the scope of their areas of responsibility (e.g. Director of Operations, Chief Pilot(s), Director of Maintenance, Chief Inspector). Managers are specifically responsible for hazard identification, risk assessment and assurance of the effectiveness of risk controls. §5.23 (b) of the rule also requires the organization to designate management officials with the authority to accept risk. The carrier's SMS documentation must clearly lay out these responsibilities and identify who in the company has been designated to meet them. Management officials must be informed and knowledgeable of their responsibilities and the procedures associated with accomplishing them. Note that the primary responsibility for hazard identification and risk assessment rests with operational managers. The management representative is responsible for assistance in these tasks and associated risk analysis (ref: §5.25 (c) (1)).

(2) When does the operator need to conduct SRM? SRM must be conducted any time that the design of a process, procedure, product, or service is designed, modified, or revised or if new or inadequately controlled hazards are discovered during normal operations or safety assurance activities. It is also recommended that SRM be conducted whenever repeated problems are encountered with any process of procedure. It is possible that performance difficulties are due to latent problems with process or procedure design.

> **NOTE:** The SRM flow diagram (Figure 2, on the following page) includes the FAA SMS Framework (Appendix 1) element/process numbers and other notes to help the reader visualize the FAA SMS Framework in terms of a process flow (with interfaces, i.e., inputs and outputs), and understand the component/element/process expectations.

FIGURE 2. SAFETY RISK MANAGEMENT PROCESS FLOW
(Numbers refer to Appendix 1, elements & processes)



(3) Safety Risk Management Processes:

(a) System Description and Task Analysis. (Appendix 1, Process 2.1.1) SRM begins with system design. This is true whether the system in question is a physical system, such as an aircraft, or an organizational system such as an operator, maintenance, or training establishment. These systems consist of the organizational structures, processes, and procedures, as well as the people, equipment, and facilities used to accomplish the organization's mission. The system or task descriptions should completely explain the interactions among the organization (facilities, hardware, software, people, etc.) and environment that make up the system in sufficient detail to identify hazards and perform risk analyses. While systems should be documented, no particular format is required. System documentation would normally include the operator's manual system,[4] checklists, organizational charts, and personnel position descriptions. A suggested functional breakdown of operational and support processes for air operators includes (MRO's are shown in Appendix 1, Component 1.0 b (1) (b)):

1) Flight operations;
2) Dispatch/flight following;
3) Maintenance and inspection;
4) Cabin safety;
5) Ground handling and servicing
6) Cargo handling; and
7) Training.

NOTE: Long and excessively detailed system or task descriptions are not necessary, provided they are sufficiently detailed to perform hazard and risk analyses. Long

The system or task descriptions should completely explain the interactions among the hardware, software, people, and environment that make up the system in sufficient detail to identify hazards and perform risk analyses. At a minimum, the system analysis and description must consider the following:

- Function and purpose of the system (within the scope of the proposed development, revision, or change)
- The system's operating environment
- An outline of the system's processes and procedures
- The:
  - Personnel,
  - Equipment, and
  - Facilities, necessary for the operation of the system.

[4] While SMS manuals are not required, operators and agencies may find them to be a practical means of documenting their policies and procedures.

(b) Hazard Identification. (Appendix 1, Process 2.1.2; § 5.53) Hazards in the system and its operating environment must be identified, documented, and controlled. It also requires that the analysis process used to define hazards consider all components of the system, based on the system description detailed above. The key question to ask during analysis of the system and its operation is *what if?* As with system and task descriptions, judgment is required to determine the adequate level of detail. While identification of every conceivable hazard would be unlikely, aviation service providers are expected to exercise due diligence in identifying significant and reasonably foreseeable hazards related to their operations.

(c) Risk Analysis and Assessment. (Appendix 1, Process 2.2.1 and 2.2.2; § 5.53 & § 5.55) The risk analysis and risk assessment components of the FAA SMS Framework use a conventional breakdown of risk by its two components: likelihood of occurrence of an injurious mishap and severity of the mishap related to an identified hazard, should it occur. A common tool for risk decision making and acceptance is a risk matrix similar to those in the U.S. Military Standard (MIL STD 882) and the ICAO Safety Management Manual (SMM)[5]. Appendix 3 discusses and provides a model and example of safety risk matrices. Operators should develop a matrix that best represents their operational environment. Separate matrices with different risk acceptance criteria may also be developed for long-term versus short-term operations.

(1)Management Role in Risk Assessment. Risk assessment is the process where management or other decision making body applies analytical judgments to safety information and determines the acceptability of analyzed risk. Risk assessment results in a decision and is, therefore, a management function. §5.23 (a) (2) (i) makes risk assessment a management responsibility and a responsibility of the organization to define those responsibilities for their management personnel. §5.23 (b) requires the organization to designate levels of management who have the authority to accept risk. This may be accomplished thorough a hierarchy that ensures adequate consultation is conducted among managers and employees; that decisions regarding high, but potentially acceptable risk situations are made at an appropriate management level; and that managers are aware of the resources, supervision, and other controls that will be necessary to make risk controls effective.

(d) Controlling Risk. (Appendix 1, Process 2.2.3; § 5.55) After hazards and risk are fully understood from the preceding steps, risk controls must be designed and implemented. These may be additional or changed procedures, new supervisory controls, addition of organizational hardware, or software aids, changes to training,

[5] The ICAO SMM is Document 9859 and is available at: http://www.icao.int/anb/safetymanagement/Documents.html

additional, or modified equipment, changes to staffing arrangements, or any of a number of other system changes.

1) Residual and Substitute Risk. (Appendix 1, Process 2.2.3) Residual risk is the risk remaining after mitigation has been completed. Often this is a multistep process, continuing until risk has been mitigated down to an acceptable level. It is seldom possible to entirely eliminate risk, even when highly effective controls are used. After controls are designed but before the system is placed back on line, an assessment must be made of whether the controls are likely to be effective and/or if they introduce new hazards to the system. The latter condition, introduction of new hazards, is referred to as substitute risk, a situation where the solution is worse than the original risk. The loop seen in Figure 2, that returns back to the top of the diagram depicts the use of the preceding systems analysis, hazard identification, risk analysis, and risk assessment processes to determine if the modified system is acceptable.

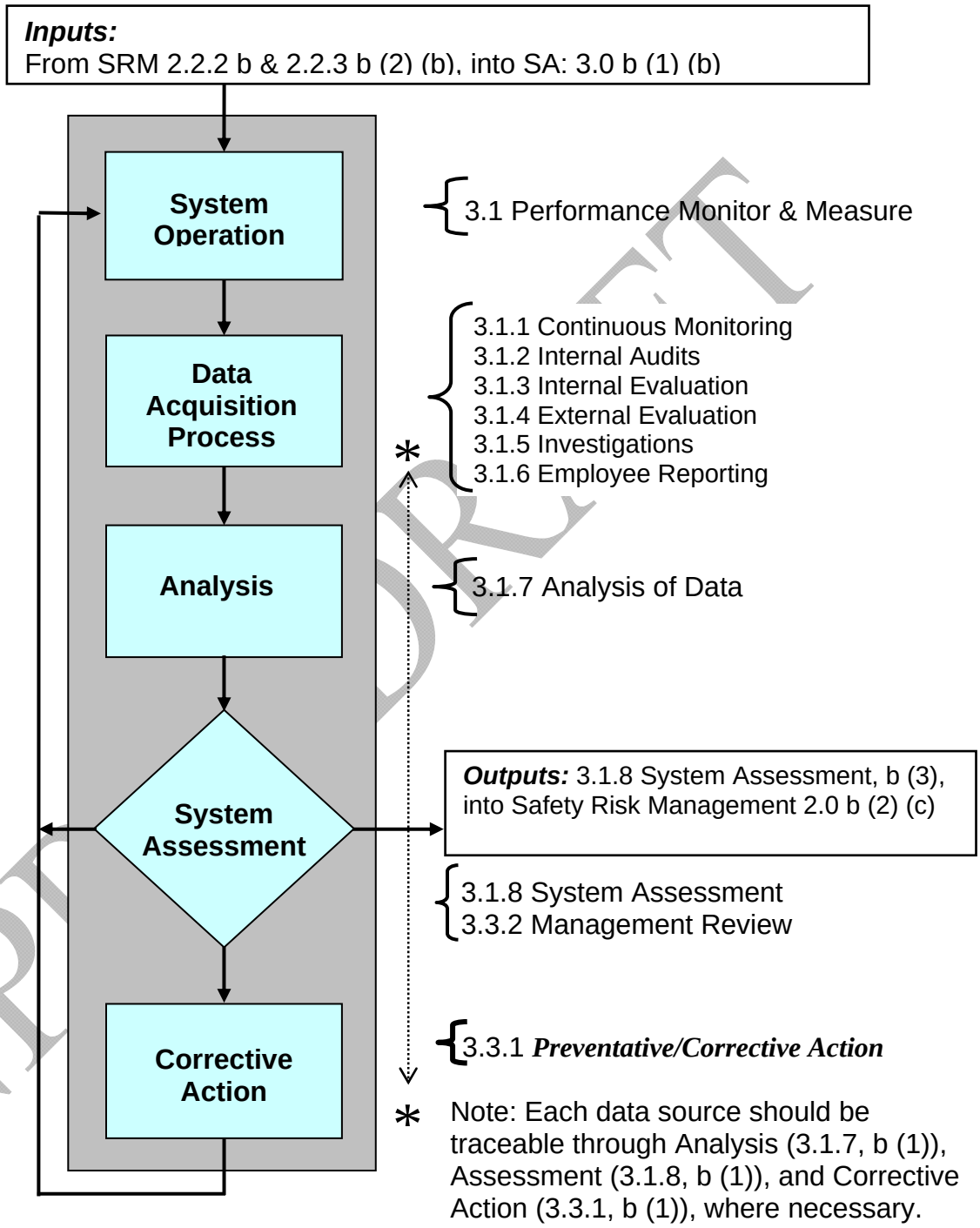
(e) System Operation. (Appendix 1, Process 2.2.3) When the controls are acceptable, the system is placed into operation. The next process, Safety Assurance, uses auditing, analysis, and review systems that are familiar from similar quality management systems. These processes are used to monitor the risk controls to ensure they continue to be implemented as designed and continue to be effective in a changing operational environment. Managers are also responsible for assurance that risk controls are effective (ref: §5.25 (c) (2)). Therefore, the design of any good risk control should include plans and provisions for monitoring, measuring, and, where necessary, improving the performance and effectiveness of risk controls.

d. Safety Assurance. Managing the Expectations (Appendix 1, Component 3.0; Part 5, Subpart D). Black's Law Dictionary, a popular legal reference, defines *assurance* as *something that gives confidence*. Therefore, SA might be defined as activities designed to gain confidence that risk controls established during SRM (Appendix 1, Component 2.0) continue to be effective. The SA function applies the activities of safety assurance and internal evaluation to ensure that risk controls, once designed, continue to conform to their expectations and that they continue to be effective in maintaining risk within acceptable levels. These assurance and evaluation functions also provide a basis for continuous improvement.

(1) Management Responsibility in Safety Assurance. §5.23 (a) (2) (ii) of the SMS rule requires managers to take steps to assure the effectiveness of risk controls within the scope of their areas of responsibility. Activities involved in meeting this responsibility include continuous monitoring, internal audit, system analysis and assessment, management of change, and corrective action.

NOTE: The SA Process Flow diagram, Figure 3, includes the FAA SMS Framework (Appendix 1) element/process numbers and other notes to help the reader visualize the FAA SMS Framework in terms of a process flow (with interfaces, i.e., inputs and outputs), and understand the component/element/process expectations.

FIGURE 3. SAFETY ASSURANCE PROCESS FLOW
(Numbers refer to Appendix 1, elements & processes)



(2) Safety Assurance Processes. (§5.71)

(a) System Operation - Performance Monitoring and Measurement. Establishment of satisfactory risk controls through the SRM process allows a process or system to be put into, or continue operation. The SA process starts with a System Description which adds structure and helps map organizational responsibilities, functions and interfaces. SA processes concentrate on proving, through collection and analysis of objective evidence (i.e., documents, records, etc.), that the processes or system expectations continue to be met. In an SMS, the system's requirements are based on assessment of risk in the organization's operation or in the products that it produces. SA techniques, including internal auditing and evaluation, are used to determine if risk controls designed into the operator's processes are being practiced and are performing as designed. If an operator already has a comprehensive IEP, it should be reviewed to ensure that it conforms to the SMS SA expectations.[6]

(b) Data Acquisition Process - Getting the facts.

1) Continuous Monitoring. (Appendix 1, Process 3.1.1; §5.71) Information for SA comes from a variety of sources, including continuous process monitoring of day-to-day activities and inputs from employees through employee reporting systems. While each of these types of information sources exists to some degree in every organization, the FAA SMS Framework formalizes requirements for each. Line managers are the technical experts in any organization and thus the most knowledgeable about the specific processes involved. Line managers of the operational departments should exercise their responsibility for monitoring these processes and periodically assessing the status of routine operations and risk controls. Specifications for these and other related SA processes are left at a functional level, allowing individual organizations to tailor them to the scope and scale appropriate for their size and type of organization.

2) Internal Audits by Operating Departments. (Appendix 1, Process 3.1.2; §5.71) The accountable executive has the ultimate responsibility and authority for the SMS; however, line managers of operational departments have the daily responsibility for quality control and for ensuring that the processes in their areas of responsibility function as designed. Thus, the primary responsibility for safety management rests with those who own the technical processes. It is here where hazards are most directly encountered, where deficiencies in processes contribute to risk, and where direct supervisory control and resource allocation can mitigate the risk to acceptable levels. Line managers exercise their responsibility through internal auditing of their process. The FAA SMS Framework specifies a responsibility for internal auditing of the operator's productive processes. As with other requirements, the FAA SMS Framework's auditing requirements are left at

[6] The SA functions in the SMS Framework contained in Appendix 1 were derived almost directly from ISO 9000-2000, the international quality management standard and the IEP development guidance in AC 120-59.

a functional level, allowing for a broad range of complexity, commensurate with the complexity of the organization.

3) Internal Evaluation. (Appendix 1, Process 3.1.3; §5.71) This function involves evaluation of the technical processes of the operator and the SMS-specific functions. Audits conducted for the purpose of this requirement must be conducted by people or organizations that are functionally independent of the technical process being evaluated. For example, a flight training department may be evaluated by a safety specialist, quality assurance department or another organization, as directed by top management, but may not be evaluated by personnel who are under the control of the flight training department. The internal evaluation function also requires evaluation of the safety management functions, policymaking, SRM, SA, and safety promotion. These evaluations provide management officials with objective evidence with which to evaluate the SMS itself.

NOTE: The provisions of the SMS are not intended to duplicate the functions of a Continuing Analysis and Surveillance System (CASS) or Internal Evaluation Program (IEP). In fact, these systems and programs should be an integrated part of a comprehensive SMS (see Section 5, below). Additionally, §5.25 does not explicitly make internal evaluation the responsibility of the management representative or Director Of Safety, but the requirement in the cited subpart is best served by the internal evaluation function. Moreover, this is consistent with the definition of the internal evaluation function in the CASS and IEP Advisory Circulars. Further discussion is in Appendix 6.

4) External Audits. (Appendix 1, Process 3.1.4) External audits of the SMS may be conducted by the regulator (FAA), code-share partners, customer organizations, or other third parties selected by the operator. These audits not only provide a strong interface with the Safety Oversight System but also a secondary assurance system. It is not the intent of an SMS to require the arrangement or purchase of external audits, especially by small operators. However, if external audits are conducted of the organization, the data collected should be used by the organization in their data acquisition process.

5) Investigations. (Appendix 1, Process 3.1.5; §5.71) Investigation of safety occurrences should have the objective of identifying systemic safety deficiencies (poor system design, failed controls, failed preventative/corrective actions, etc.) rather than assigning blame. It is not as important to identify *who did it* as it is to learn *why it happened.* System resilience can be much more effectively reinforced by removing systemic deficiencies than by removing individuals, who may only be caught in the human activity of making mistakes.

6) Employee Reporting System. (Appendix 1, Process 3.1.6; §5.71) The FAA SMS Framework specifies that the aviation service provider must provide for a means of employee communication that allows for timely submission of reports on safety deficiencies without fear of reprisal The main objective of an employee safety reporting and feedback system is to establish and maintain an environment

in which employees can report hazards, issues and concerns, as well as occurrences, incidents, etc., and propose safety solutions and improvements. Employees must be encouraged by the accountable executive and other members of management to use the employee reporting system without fear of reprisals. Data from the safety reporting and feedback system should be monitored to identify emerging hazards. Additionally, data collected in the safety reporting and feedback system should be included in all SMS analysis functions. Many certificated operators already have invested in ASAP. ASAP is a collaborative, reporting, analyses and problem solving effort among the FAA, operators, and employee unions. As mentioned earlier, this program is an example of a voluntary program that could be integrated into the SMS (providing it encompasses the entire organization), having a strong potential to contribute to SA and Safety Promotion.

7) Analysis and Assessment. (Appendix 1, Processes 3.1.7 and 3.1.8; §5.73) Audits and other information gathering activities are useful to management only if the information is provided in a meaningful form and conclusions are drawn to form a bottom-line assessment. Recall that a primary purpose of the SA process is to assess the continued effectiveness of risk controls put into place by the SRM process. Where significant deviations to existing controls are discovered, the FAA SMS Framework requires a structured, documented process for preventive and corrective action to place the controls back on track.

(c) Management of Change. (Appendix 1, Element 3.2; §5.73) A management of change process should identify changes within the organization which may affect established processes, procedures, products, and services. Before implementing changes, a management of change process should describe the arrangements to ensure safety performance. The result of this process is the reduction in the safety risks resulting from changes in the provision of services by the organization. Management of change should consider the criticality of the system and activities, the stability of the system and operational environment and past performance of the system.

(d) Continuous Improvement. (Appendix 1, Element 3.3; §5.75) The organization must continuously improve the effectiveness of the SMS and of safety risk controls through the use of the safety and quality policies, objectives, audit and evaluation results, analysis of data, corrective and preventive actions, and management reviews. As part of the SA function, the analysis and assessment functions must alert the organization to significant changes in the operating environment, possibly indicating a need for system change to maintain effective risk control. When this occurs, the results of the assessment start the SRM process, as depicted in Figure 3. One of Dr. James Reason's principles of organizational safety culture is that of a *learning culture*.[7] The information in reports, audits, investigations, and other data sources is not useful if the organization does not learn from it. The FAA SMS Framework requires an analysis process, a preventive/corrective action process, and a path to the

[7] Reason. Managing the Risks of Organizational Accidents.

SRM process for the development of new safety controls, as environments change and new hazards are identified. It further requires that the organization provide training and information about risk controls and lessons learned.

(e) Corrective Action and Follow-up. (Appendix 1, Process 3.3.1; §5.75) The SA process should include procedures that ensure that corrective actions are developed, documented, and tracked in response to findings of audits and evaluations, and to verify their timely and effective implementation. Organizational responsibility for the development and implementation of corrective actions should reside with the operational departments cited in audit and evaluation findings. If new hazards are discovered, the SRM process should be employed to determine if new risk controls should be developed.

(f) Management Review. (Appendix 1, Process 3.3.2; §5.73) The accountable executive (a position required for part 121 air carriers) should conduct regular reviews of the SMS, including outputs of SRM, SA, and lessons learned. Management reviews should include assessing the performance and effectiveness of an organization's operational processes and the need for improvements.

e. Safety Promotion. (Appendix 1, Component 4; Part 5, Subpart E). The accountable executive and other members of management have the responsibility to promote the growth of a positive safety culture. The effectiveness of an SMS program is in direct proportion to the commitment and dedication put forth by the accountable executive and other members of the management team. Management must provide adequate employee education and training to promote safety awareness and regularly communicate safety policy, goals, objectives, standards, and performance throughout the organization. Additionally, management must provide a safety information system that provides an accessible, efficient means to retrieve safety information.

(1) Safety Cultures. (Appendix 1, Component 4.0) A safety effort cannot succeed by mandate only or strict implementation of policy. Where individual attitudes are concerned, the organizational culture set by the management team, starting with the accountable executive establishes the tone that enhances the performance and efficiency of the entire SMS. Cultures consist of psychological (how people think and feel), behavioral (how people and groups act and perform) and organizational (the programs, procedures, and organization of the enterprise) elements. An organization's culture consists of the values, beliefs, mission, goals, and sense of responsibility held by the organization's members. The culture fills in the blank spaces in the organization's policies, procedures, and processes and provides a sense of purpose to safety efforts. Dr. James Reason, and other organizational system safety theorists, stresses the need for a reporting culture as an important aspect of safety culture. The organization must do what it can to cultivate the willingness of its members to contribute to the organization's safety efforts. Dr. Reason further stresses the need for a just culture, where employees have the confidence that, while they will be held accountable for their actions, the organization will treat them fairly.[8]

(2) Safety Promotion Processes

[8] Reason. Managing the Risks of Organizational Accidents.

(a) Competencies and Training. (Appendix 1, Processes 4.1.1 and 4.1.2; §5.91) There are process expectations in the Safety Promotion component (4.0) of the FAA SMS Framework to ensure employees, throughout the organization, are trained and competent on their safety-related job functions. Additionally, it is important for all employees to know how to report safety concerns and know that it is their responsibility to do so.

(b) Communication and Awareness. (Appendix 1, Element 4.2; §5.93) The accountable executive and other members of management should communicate the outputs of its SMS to its employees, and should provide its oversight organization access to SMS outputs in accordance with established agreements and disclosure programs. The processes specified in the Safety Policy, SRM, SA, and Safety Promotion components of the SMS provide the structure for the organizations processes. However, the organization must also set in place processes that allow for open communication among employees and the organization's management. The certificate holder must make every effort to communicate its goals and objectives, as well as the current status of the organization's activities and significant events. Likewise, the organization must supply a means of upward communication in an environment of collaboration, trust, and respect.

CONTACT. For additional information or suggestions, please contact the Flight Standards Service, SMS Program Office, AFS-900, at (703) 661-0516.

APPENDIX 1

CONTENTS

Paragraph Page

APPENDIX 1. CERTIFICATE HOLDER SAFETY MANAGEMENT SYSTEM FRAMEWORK: FUNCTIONAL EXPECTATIONS

1. PURPOSE OF THIS APPENDIX. To provide standardization and a uniform set of expectations (basic functional expectations) for SMS development by aviation service providers.

2. SCOPE AND APPLICABILITY.

a. This FAA SMS Framework describes the expectations for a certificate holder's SMS in the air transportation system. (see Note under Paragraph 2.a. "Developing an SMS", in the main body of the AC)

(1) This advisory circular (AC) is not mandatory and does not constitute a regulation. However, development and implementation of an SMS for part 121 certificate holder is required per Title 14 of the Code of Federal Regulations (14 CFR part 5). For other certificate holders and service providers, development and implementation of an SMS is voluntary.

(2) . While the Federal Aviation Administration (FAA) encourages each aviation service provider to develop and implement an SMS, these systems are not substitutes for compliance with Federal regulations and all other certificate requirements, where applicable. However, for aviation service providers that elect to voluntarily implement an SMS, the FAA views the objectives and expectations in Appendix 1 to this AC to be the minimum for a comprehensive and robust SMS.

(3) This FAA SMS Framework is intended to address aviation safety related operational and support processes and activities that are related to aviation safety, not occupational safety, environmental protection, or customer service quality.

(4) The expectations of this FAA SMS Framework apply to SMSs developed and used by organizations that provide products and/or services in the air transportation system.

(5) Operators and service providers are responsible for the safety of services or products contracted to or purchased from other organizations.

b. While this document establishes the minimum acceptable expectations; oversight orgaizations and service providers may establish more stringent requirements.

3. REFERENCES. This AC is in accordance with the following documents, current editions:

- Title 14 of the Code of Federal Regulations, Part 5.
- Annex 6 to the Convention on International Civil Aviation, Part 1 International Commercial Air Transport – Aeroplanes with Amendment 33.
- International Civil Aviation Organization (ICAO) Document 9859, ICAO Safety Management Manual (SMM, 2nd Edition, 2009).
- FAA Order 8000.369, Safety Management System Guidance.

- FAA Order VS 8000.367, Aviation Safety (AVS) Safety Management System Requirements.

4. DEFINITIONS.

a. Accident. An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage (Title 49 of the Code of Federal Regulations (49 CFR) § 830.2, Definitions).

b. Analysis. The conversion of data into information, to identify measures that predict safety related problems to allow risk-management decision-making, by the identification of trends, deficiencies and root causes. This involves the processes of identifying a question or issue to be addressed, modeling the issue, investigating model results, interpreting the results, and possibly making a recommendation. Analysis typically involves using scientific or mathematical methods for evaluation.

c. Assessment. The process of measuring or judging the value or level of something.

d. Attributes. System Attributes, are inherent characteristics of a system that apply to an effective SMS. While the six system attributes were first applied with Air Transportation Oversight System (ATOS) fielding, there are differences when applied to SMS, as discussed below:

(1) Responsibility. Who is accountable for management and overall quality of the process (planning, organizing, directing, controlling) and its ultimate accomplishment.

(2) Authority. Who can direct, control, or change the process, as well as who can make key decisions such as risk acceptance. This attribute also includes the concept of empowerment.

(3) Procedures. International Organization for Standardization (ISO)-9001-2000 defines "procedure" as "a specified way to carry out an activity or a process" – procedures translate the *what* in goals and objectives into *how* in practical activities (things people do). Procedures are simply documented activities to accomplish processes, e.g., a way to perform a process. The organization should specify their own procedures for accomplishing processes in the context of their unique operational environment, organizational structure, and management objectives.

(4) Controls. Controls are elements of the system, including hardware, software, special procedures, or procedural steps, and supervisory practices designed to keep processes on track to achieve their intended results. Organizational process controls are typically defined in terms of special procedures, supervisory and management practices, and processes. Many controls are inherent features of the FAA SMS Framework. Practices such as continuous monitoring, internal audits, internal evaluations, and management reviews (all parts of the Safety Assurance (SA) component) are identified as controls within the design expectations.

Additionally, other practices such as documentation, process reviews, and data tracking are identified as controls within specific elements and processes.

(5) Process Measures. Ways to provide feedback to responsible parties that required actions are taking place, required outputs are being produced, and expected outcomes are being achieved. A basic principle of SA is that fundamental processes be measured so that management decisions can be data-driven. The general expectations for Component 1, policy, specify that SMS outputs be measured and analyzed. These measurements and analyses are accomplished in Component 3, SA. Outputs of each process should, therefore, be identified during component 3 activities. For example, these outputs should be the subjects of continuous monitoring, internal audits, and internal evaluation.

(6) Interfaces. This aspect includes examining such things as lines of authority between departments, lines of communication between employees, consistency of procedures, and clearly delineating lines of responsibility between organizations, work units, and employees. Interfaces are the *inputs* and *outputs* of a process.

e. Audit. Scheduled, formal reviews and verifications that evaluate whether an organization has complied with policy, standards, and/or contract requirements. An audit starts with the management and operations of the organization and then moves to the organization's activities and products/services.

(1) Internal Audit. An audit conducted by, or on behalf of, the organization being audited, e.g., the flight training department audits the flight training department.

(2) External Audit. An audit conducted by an entity outside of the organization being audited, e.g., the flight operations department audits the flight training department.

f. Aviation Service Provider. Refer to definition for *organization* below. *Aviation service provider* is interchangeable with the terms *service provider* and *organization* within this document.

g. Aviation System. The functional operation or production system used by an organization to produce an aviation product or service (see subparagraphs p. and xx.).

h. Complete. Nothing has been omitted and what is stated is essential and appropriate to the level of detail.

i. Competency. An observable, measurable set [pattern] of skills, knowledge, abilities, behaviors, and other characteristics that an individual needs to perform work roles of occupational functions successfully. Competencies are typically required at different levels of proficiency depending on the work roles or occupational function. Competencies can help ensure that individual and team performances align with the organization's mission and strategic direction.

j. Conformity. Fulfilling or complying with a requirement (refer to ISO 9001-2000); this includes but is not limited to complying with Federal aviation regulations. It also includes

complying with company requirements, requirements of operator developed risk controls, or operator policies and procedures.

k. Continuous Monitoring. Uninterrupted (constant) watchfulness (checks, audits, etc) over a system.

l. Corrective Action. Action to eliminate (remove) or mitigate (lessen) the cause or reduce the effects of a detected nonconformity or other undesirable (unwanted) situation.

m. Correct. Accurate without ambiguity or error in its attributes.

n. Documentation. Information or meaningful data and its supporting medium (e.g., paper, electronic, etc.). In this context, *documentation* is different from *records* because *documentation* is the written description of policies, processes, procedures, objectives, requirements, authorities, responsibilities, or work instructions; where as *records* are the evidence of results achieved or activities performed.

o. Evaluation. An independent review of company policies, procedures, and systems (refer to AC 120-59, current edition). If accomplished by the company itself, the evaluation should be done by a person or organization in the company other than the one performing the function being evaluated. The evaluation process builds on the concepts of auditing and inspection. An evaluation is an anticipatory process designed to identify and correct potential problems before they happen. An evaluation is synonymous with the term *systems audit*.

p. Function. A function consists of specific or discreet actions required by a system to achieve an objective (e.g. an operation that a system must perform in order to accomplish its mission, such as a maintenance action required to restore a system to operation). Such actions may be accomplished through the use of equipment, personnel, facilities, firmware, software, or a combination thereof. In a broader sense, the term function refers to what is expected to be incorporated into each system rather than how the system accomplishes its objective. This makes for a more performance-based system and allows for a broad range of techniques to be used to accomplish the performance objectives. This, in turn, maximizes scalability while preserving standardization of results across the aviation organization communities.

q. Hazard. Any existing or potential condition that can lead to injury, illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment (environmental issues are not within the scope of the SMS). A hazard is a condition that might cause (is a prerequisite to) an accident or incident.

r. Incident. An occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations (49 CFR § 830.2, Definitions).

s. Lessons Learned. Knowledge or understanding gained by experience, which may be positive, such as a successful test or mission, or negative, such as a mishap or failure. Lessons learned should be developed from information obtained from inside and outside of the organization and/or industry.

t. Likelihood. The estimated probability or frequency, in quantitative or qualitative terms, of an occurrence related to the hazard.

u. Line Management. The management structure that operates (controls, supervises, etc) the operational activities and processes of the aviation system.

v. Nonconformity. Non-fulfillment of a requirement (refer to ISO 9000-2000). This could include but is not limited to, noncompliance with Federal regulations, company requirements, requirements of operator-developed risk controls or operator-specified policies and procedures.

w. Objective. The desired state or performance target of a process. Usually it is the final state of a process and contains the results and outputs used to obtain the desired state or performance target.

x. Operational Life Cycle. Period of time from implementation of a product/service until it is no longer in use.

y. Organization. Within the context of this document, the term *organization* refers to any organization providing aviation services. The term includes certificated and non-certificated aviation organizations, aviation service providers, air carriers, airlines, maintenance repair organizations, air taxi operators, corporate flight departments, repair stations, pilot schools, approved training organizations that are exposed to safety risks during the provision of their services and organizations responsible for type design and/or manufacture of aircraft. (Also see *service provider* below). The tern o*rganization* is interchangeable with the term *aviation service provider* and *service provider* within this document.

z. Outputs. The product or end result of an SMS process, which is able to be recorded, monitored, measured, and analyzed. Outputs are the minimum expectation for the product of each process area and the input for the next process area in succession. Each of the outputs of a process should have a method of measurement specified by the organization. Measures need not be quantitative where this is not practical; however, some method of providing objective evidence of the attainment of the expected output is necessary. A table of expected SMS process outputs is in Appendix 4.

aa. Oversight. A function performed by the FAA (or other regulator i.e., in an international country) that ensures that an aviation organization complies with and uses safety-related standards, requirements, regulations, and associated procedures. Safety oversight also works to assure that the acceptable level of safety risk is not exceeded in the air transportation system.

bb. Preventive Action. Preemptive action to eliminate or mitigate the potential cause or reduce the future effects of an identified or anticipated nonconformity or other undesirable situation.

cc. Procedure. Specified ways to carry out operational activities that translate the *what* (objectives) into *how* (practical activities).

dd. Process. A set of interrelated or interacting activities that transform inputs into outputs.

ee. Process Measures. Refer to definition for process measures under the *attributes* definition, above, i.e., a means of providing feedback to responsible parties that required actions are taking place, required outputs are being produced, and expected outcomes are being achieved.

ff. Product/Service. Anything that is offered or can be purchased that might satisfy a want or need in the air transportation system.

gg. Records. Evidence of results achieved or activities performed (also see *documentation* above).

hh. Residual Safety Risk. The safety risk that exists after mitigation has been accomplished or all controls have been implemented or exhausted and verified. Only verified controls can be used for assessing residual safety risk.

ii. Risk. The composite of predicted severity (how bad) and likelihood (how probable) of the potential effect of a hazard in its worst credible (reasonable or believable) system state. The terms *risk* and *safety risk* are interchangeable for the purposes of this document.

jj. Risk Control. Steps taken to eliminate (remove) hazards or to mitigate (lessen) their effects by reducing the severity and/or likelihood of risk associated with those hazards.

kk. Safety Assurance (SA). A formal management process within the SMS that systematically provides confidence that an organization's products/services meet or exceed safety requirements. SA expectations are provided in this FAA SMS Framework, Component 3.0.

ll. Safety Culture. The product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, the organization's management of safety. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures.

mm. Safety Management System (SMS). The formal, top-down business-like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (as described in this document it includes SRM, Safety Policy, SA, and Safety Promotion).

nn. Safety Objective.[9] A goal or desirable outcome related to safety. Generally based on the organization's safety policy, and specified for relevant functions and levels in the organization. Safety objectives are typically measurable.

oo. Safety performance. Realized or actual safety accomplishment relative to the organization's safety objectives.

[9] Adapted from definition 3.2.5 in ISO 9000-2000 for *quality objectives.*

pp. Safety policy means the certificate holder's documented commitment to safety, which defines its safety objectives and the accountabilities and responsibilities of its employees in regards to safety.

qq. Safety Planning.[10] Part of safety management focused on setting safety objectives and specifying needed operational processes and related resources to fulfill these objectives.

rr. Safety Risk. The composite of predicted severity (how bad) and likelihood (how probable) of the potential effect of a hazard in its worst credible (reasonable or believable) system state. The terms *safety risk* and *risk* are interchangeable for the purposes of this document.

ss. Safety Risk Control. A characteristic of a system that reduces or mitigates (lessens) the potential undesirable effects of a hazard. Controls may include process design, equipment modification, work procedures, training or protective devices. Safety risk controls must be written in requirements language, measurable, and monitored to ensure effectiveness.

tt. Safety Risk Management (SRM). A formal process within the SMS that describes the system, identifies the hazards, assesses the risk, analyzes the risk, and controls the risk. The SRM process is embedded in the processes used to provide the product/service; it is not a separate/distinct process. SRM expectations are provided in the FAA SMS Framework, Component 2.0.

uu. Safety Promotion. A combination of safety culture, training, and data sharing activities that support the implementation and operation of an SMS in an organization. Safety promotion expectations are provided in this FAA SMS Framework, Component 4.0.

vv. Separate Aviation Maintenance Organizations. Are independent maintenance organizations such as, but not limited to, certificated repair stations, non-certificated repair facilities, and separate maintenance organizations. This does not include an air operator's maintenance organization and is not intended to duplicate Component 1.0b(1)(a)(3) of an air operator's organization.

ww. Service Provider. (Refer to definition for *Organization* above). The term s*ervice provider* is interchangeable with the terms *aviation service provider* and *organization* within this document.

xx. Severity. The degree of loss or harm resulting from a hazard.

yy. Substitute Risk. A risk unintentionally created as a consequence of safety risk control(s).

zz. System. An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people,

[10] Adapted from definition 3.2.9 in ISO 9000-2000 for *quality planning.*

hardware, software, firmware, information, procedures, facilities, services, and other support facets.

aaa. System Attributes. Refer to definition for *attributes*, above.

bbb. Top Management. The person or group of people who direct and control an organization (ref. ISO 9000-2005 definition 3.2.7 - person or group of people who directs and controls an organization at the highest level). Top management translates the policy into goals, objectives and strategies, and projects a shared-vision of the future. It makes decisions that affect everyone in the organization, and is held entirely responsible for the success or failure of the enterprise. In many large organizations, this can be the Chief Executive Officer (CEO), chairman/chairwoman, president or the board of directors; in smaller organizations, this might be the owner of the company.

5. SMS FRAMEWORK: FUNCTIONAL EXPECTATIONS.

5.1 FAA SMS FRAMEWORK STRUCTURE. The FAA SMS Framework is broken down into components, elements, and processes. The components and elements are based on the ICAO Framework. Elements in the SRM, SA, and Safety Promotion components are further broken down into processes. The processes provide additional details to facilitate an organizations implementation of an SMS.**NOTE:** Specific Regulatory References (SRR's) associated with each element and process in this Framework, refer to Title 14, Combined Federal Regulations (CFR), Part 5.

5.2 FAA SMS FRAMEWORK EXPECTATIONS. This section describes expected characteristics of a robust SMS. They are considered functional expectations because they describe the *what*, not the *how* of each process. For example, the *what* of a deicing process is to prevent any aircraft from taking off with ice adhering to any critical control surface. The *how* of the de-icing process would include deicing equipment procedures, flight crew deicing procedures, hold over table activities, etc., and may be different between individual organizations. Organizations are expected to meet FAA SMS Framework expectations by developing processes to fit their unique business and management models.

5.3 FAA SMS FRAMEWORK ELEMENTS AND PROCESSES. FAA SMS Framework elements and processes are further defined in terms of performance objectives and design expectations:

a. Performance Objectives. Are the desired outcomes of the particular element or process under evaluation.

b. Design Expectations. Are the characteristics of the element or process that, if properly implemented, should provide the outcomes identified in the performance objectives.

COMPONENT 1.0 SAFETY POLICY AND OBJECTIVES.

SRR - Part 5, Subpart B – Safety Policy

a. Performance Objectives. The organization will develop and implement an integrated, comprehensive SMS for its entire organization and will incorporate procedures to identify and maintain compliance with current safety-related legal, regulatory, and statutory requirements.

b. General Design Expectations.

(1) Safety management will be included in the complete scope and life cycle of the organization's systems including:

(a) For air operators:

1. Flight operations,

2. Operational control (dispatch/flight following),

3. Maintenance and inspection,

4. Cabin safety,

5. Ground handling and servicing,

6. Cargo handling, and

7. Training.

(b) For separate aviation maintenance organizations:

1. Parts/materials,

2. Resource management (tools and equipment, personnel, and facilities),

3. Technical data,

4. Maintenance and inspection,

5. Quality control,

6. Records management,

7. Contract maintenance, and

8. Training.

(2) SMS processes will be:

(a) Documented,

(b) Monitored,

(c) Measured, and

(d) Analyzed.

(3) SMS outputs will be:

(a) Recorded,

(b) Monitored,

(c) Measured, and

(d) Analyzed.

(4) It is expected that:

(a) The organization will promote the growth of a positive safety culture (described under Component 4b (§5.23 (a) (2) (iii));

(b) If the organization has a quality policy, the accountable executive will ensure that the quality policy is consistent with the SMS;

(c) The SMS will include a means to comply with FAA policy, legal, regulatory and statutory requirements applicable to the SMS;

(d) The organization will establish and maintain a procedure to identify current FAA policy, legal, regulatory and statutory requirements applicable to the SMS;

(e) The organization will establish and maintain procedures with measurable criteria to accomplish the objectives of the safety policy[11];

(f) The organization will establish and maintain supervisory and operational controls to ensure procedures are followed for safety-related operations and activities; and

(g) The organization will establish and maintain a safety management plan to describe how it will achieve its safety objectives.

ELEMENT 1.1 SAFETY POLICY.

SRR - §5.21 Safety Policy.

a. Performance Objective. The accountable executive will define the organization's safety policy and convey its expectations, objectives, commitments, and accountabilities to its employees.

[11] Measures are not expected for each procedural step. However, measures and criteria should be of sufficient depth and level of detail to ascertain and track accomplishment of objectives. Criteria and measures can be expressed in either quantitative or qualitative terms.

b. Design Expectations.

(1) The accountable executive will define and sign the organization's safety policy.

(2) The safety policy will:

(a) Include a commitment to implement and maintain the SMS;

(b) Include a commitment to continuously improve the level of safety;

(c) Include a commitment to the management of safety risk;

(d) Include a commitment to comply with applicable regulatory requirements;

(e) Include a commitment to encourage employees to report safety issues without reprisal (as per Process 3.1.6 (§5.71 (a));

(f) Establish clear standards for acceptable operational behavior for all employees;

(g) Provide management guidance for setting safety objectives;

(h) Provide management guidance for reviewing safety objectives;

(i) Be documented;

(j) The accountable executive will ensure that the safey policy is communicated with visible management endorsement to all employees and responsible parties;

(k) The accountable executive will review the safety policy periodically to ensure it remains relevant and appropriate to the organization; and

(l) Identify responsibility and accountability of management and employees with respect to safety performance.

ELEMENT 1.2 MANAGEMENT COMMITMENT AND SAFETY ACCOUNTABILITIES.

SRR - §5.23 Safety accountability and authority.

a. Performance Objective. The organization will define, document, and communicate the safety roles, responsibilities, and authorities throughout its organization.

b. Design Expectations.

(1) The organization will designate an accountable executive[12] who will have the ultimate responsibility for the SMS.

(2) The accountable executive will:

(a) Ensure that the SMS is properly implemented and performing in all areas of the organization.

(b) Provide resources essential to implement and maintain the SMS.

(c) Regularly review the safety performance of the organization and direct actions necessary to address substandard safety performance.

(3) Aviation safety-related positions, responsibilities, and authorities will be

(a) Defined,

(b) Documented, and

(c) Communicated throughout the organization.

(4) The organization will define levels of management that can make safety risk acceptance decisions as described in Component 2.0b (4) (c) (§ 5.23 (a) (3) (b)).

(5) All members of management will be responsible within their area of responsibility for:

(i) Hazard identification and safety risk assessment.

(ii) Assuring the effectiveness of safety risk controls.

(iii) Promoting safety in their organizations.

(iv) Advising the accountable executive on the performance of the SMS and on any need for improvement.

ELEMENT 1.3 KEY SAFETY PERSONNEL.

SRR - §5.25 Designation and responsibilities of required safety management personnel.

a. Performance Objective. The organization will appoint a management representative to manage, monitor, and coordinate the SMS processes.

b. Design Expectations.

[12] Additional information on selection and designation of the accountable executive is available in Appendix 5.

(1) The accountable executive will appoint a member of management who, irrespective of other responsibilities, will have responsibilities and authority that includes:

(a) Ensuring that processes needed for the SMS are established, implemented, and maintained;

(b) Report to the accountable executive on the performance of the SMS and the need for improvement; and

(c) Ensure the promotion of awareness of safety expectations throughout the organization.

(d) Facilitating hazard identification and risk analysis.

(e) Monitoring the effectiveness of safety risk controls.

ELEMENT 1.4 EMERGENCY PREPAREDNESS AND RESPONSE.

SRR - §5.27 Coordination of emergency response planning.

a. Performance Objective. The organization will develop and implement procedures that it will follow in the event of an accident or incident or operational emergency to mitigate the effects of these events.

b. Design Expectations. The organization will establish procedures to:

(1) Identify hazards that have potential for accidents and incidents;

(2) Coordinate and plan the organization's response to accidents, incidents or operational emergencies; and

(3) Execute periodic exercises of the organization's response.

ELEMENT 1.5 SMS DOCUMENTATION AND RECORDS.

SRR - Subpart F - SMS Documentation and Recordkeeping, §5.95 SMS documentation, §5.97 SMS records.

a. Performance Objectives. The organization will have documented safety policies, objectives, procedures, a document/record management process and a safety management plan that meet organizational safety expectations and objectives.

b. Design Expectations.

(1) The organization will establish and maintain information, in paper or electronic form, to describe:

(a) Safety policies;

(b) Safety objectives;

(c) SMS expectations;

(d) Safety procedures and processes;

(e) Accountabilities, responsibilities and authorities for safety-related procedures and processes;

(f) Interactions/interfaces between the safety-related procedures and processes; and

(g) SMS outputs.

(2) The organization will maintain their safety management plan in accordance with the objectives and expectations contained within this element (1.5).

(3) Documentation Management.

(a) Documentation will be:

1. Legible,

2. Dated (with dates of revisions),

3. Readily identifiable,

4. Maintained in an orderly manner, and

5. Retained for a specified period of time as determined by the organization or the requirements specified in §5.97, where applicable.

(b) The organization will establish and maintain procedures for controlling all documents required by this FAA SMS Framework to ensure that:

1. They can be located; and

2. They are periodically:

a. Reviewed,

b. Revised as needed, and

c. Approved for adequacy by authorized personnel.

(c) The current versions of relevant documents are available at all locations where essential SMS operations are performed; and

(d) Obsolete documents are promptly removed from all points of use or otherwise assured against unintended use.

(4) Records Management.

(a) The organization will establish and maintain procedures to:

1. Identify,

2. Maintain, and

3. Dispose of their SMS records.

(b) SMS records will be:

1. Legible,

2. Identifiable, and

3. Traceable to the activity involved.

(c) SMS records will be maintained in such a way that they are:

1. Readily retrievable and;

2. Protected against:

a. Damage,

b. Deterioration, or

c. Loss.

(d) Records retention times will be documented.

COMPONENT 2.0 SAFETY RISK MANAGEMENT (SRM).

SRR - Part 5, Subpart C - Safety Risk Management, §5.51 Applicability.

a. Performance Objective. The organization will develop processes to understand the critical characteristics of its systems and operational environment and apply this knowledge to identify hazards, analyze and assess risk and design risk controls.

b. General Design Expectations.

(1) SRM will, at a minimum, include the following processes:

(a) System description and task analysis,

(b) Hazard identification,

(c) Safety risk analysis,

(d) Safety risk assessment, and

(e) Safety risk control and mitigation.

(2) The SRM process will be applied to:

(a) Initial designs of systems, organizations, and/or products;

(b) The development of operational procedures;

(c) Hazards that are identified in the SA functions (described in Component 3.0b; and

(d) Planned changes to operational processes.

(3) The organization will establish feedback loops between assurance functions described in Component 3.0 to evaluate the effectiveness of safety risk controls.

(4) The organization will define a risk acceptance process that:

(a) Defines acceptable and unacceptable levels of safety risk.

(b) Describes:

1. Severity levels, and

2. Likelihood levels.

(c) Defines specific levels of management that can make safety risk acceptance decisions prescribed in accordance with Element 1.2b (4) (§ 5.23 (a) (3) (b).

(d) Defines acceptable risk for hazards that will exist in the short-term while safety risk control/mitigation plans are developed and implemented.

ELEMENT 2.1 SYSTEM ANALYSIS AND HAZARD IDENTIFICATION.

SRR - §5.53 System analysis and hazard identification.

a. Performance Objective. The organization will develop and maintain a process that ensures that hazards in operations are identified. Hazards will be identified from the analysis of critical design and performance factors, processes, and activities in sufficient detail to determine associated level of risk and risk acceptability.

b. Design Expectations. The organization will implement processes to accomplish the objectives and expectations for Processes 2.1.1 thru 2.1.2, below.

PROCESS 2.1.1 SYSTEM DESCRIPTION AND TASK ANALYSIS.

SRR - §5.53 (a) & (b).

a. Performance Objective. The organization will analyze its systems, operations, and operational environment to gain an understanding of critical design and performance factors, processes, and activities to identify hazards.

b. Design Expectations.

(1) System descriptions and task analysis will be developed to the level of detail necessary to:

(a) Identify hazards,

(b) Develop operational procedures, and

(c) Develop and implement risk controls.

(2) At a minimum, the system analysis and description must consider the following:

(a) Function and purpose of the system (within the scope of the proposed development, revision, or change)

(b) The system's operating environment

(c) An outline of the system's processes and procedures

(d) The:

- Personnel,
- Equipment, and,
- Facilities,
- Necessary for the operation of the system.

PROCESS 2.1.2 IDENTIFY HAZARDS.

SRR - §5.53 (c)

a. Performance Objective. The organization will identify and document the hazards in its operations that are likely to cause death, serious physical harm, or damage to equipment or property in sufficient detail to determine associated level of risk and risk acceptability.

b. Design Expectations.

(1) Hazards will be:

(a) Identified for the entire scope of the system, as defined in the system description[13]; and

(b) Documented.

(2) Hazard information will be:

(a) Tracked, and

(b) Managed throughout the entire SRM process.

ELEMENT 2.2 RISK ASSESSMENT AND CONTROL.

SRR - §5.55 Safety risk assessment and control.

a. Performance Objective. The organization will develop and maintain a process that ensures analysis, assessment, and control of the safety risks in system operations.

b. Design Expectations. The organization will implement processes to accomplish the expectations for Processes 2.2.1 thru 2.2.3, below.

PROCESS 2.2.1 ANALYZE SAFETY RISK.

SRR - §5.55 (a).

a. Performance Objective. The organization will determine and analyze the severity and likelihood of potential events associated with identified hazards, and will identify risk factors associated with unacceptable levels of severity or likelihood.

b. Design Expectations.

(1) The safety risk analysis process will include:

(a) Existing safety risk controls,

(b) Triggering mechanisms, and

(c) Safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the[14]:

[13] While it is recognized that identification of every conceivable hazard is impractical, organizations are expected to exercise due diligence in identifying and controlling significant and reasonably foreseeable hazards related to their operations.

1. Likelihood, and

2. Severity.

PROCESS 2.2.2 ASSESS SAFETY RISK.

SRR - §5.55 (b).

a. Performance Objective. The organization will assess risk associated with each identified hazard and define risk acceptance procedures and levels of management that can make safety risk acceptance decisions.

b. Design Expectations. Each hazard will be assessed for its safety risk acceptability using the safety risk acceptance process described in Component 2.0b (4) (§ 5.55 (b).

PROCESS 2.2.3 CONTROL/MITIGATE SAFETY RISK.

SRR - §5.55 (c).

a. Performance Objective. The organization will design and implement a risk control for each identified hazard for which there is an unacceptable risk, to reduce risk to acceptable levels. The potential for residual risk and substitute risk will be analyzed before implementing any risk controls.

b. Design Expectations.

(1) Safety control/mitigation plans will be defined for each hazard with unacceptable risk.

(2) Safety risk controls will be:

(a) Clearly described,

(b) Evaluated to ensure that the expectations have been met,

(c) Ready to be used in their intended operational environment, and documented.

(3) Substitute risk will be evaluated when creating safety risk controls/mitigations.

COMPONENT 3.0 SAFETY ASSURANCE.

SRR - Part 5, Subpart D - Safety Assurance.

a. Performance Objective. The organization will monitor, measure, and evaluate the performance and effectiveness of risk controls.

---

[14] Risk likelihood and severity may be expressed in quantitative or qualitative terms.

b. General Design Expectations.

(1) The organization will monitor their systems and operations to:

(a) Identify new hazards,

(b) Measure the effectiveness of safety risk controls,

(c) Ensure compliance with regulatory requirements applicable to the SMS, and

(d) Ensure the SA function is based upon a comprehensive system description as described in Process 2.1.1 (§ 5.53 (b) (1) thru (4).

(2) The organization will collect the data necessary to demonstrate the effectiveness of its:

(a) Operational processes, and

(b) The SMS.

ELEMENT 3.1 SAFETY PERFORMANCE MONITORING AND MEASUREMENT.

SRR - §5.71 Safety performance monitoring and measurement.

a. Performance Objective. The organization will develop and maintain a means to monitor, measure, and verify the safety performance of the organization, and to validate the effectiveness of safety risks controls.

b. Design Expectations. The organization will implement processes to accomplish the expectations for Processes 3.1.1 thru 3.1.8, below.

PROCESS 3.1.1 CONTINUOUS MONITORING.

SRR - §5.71 (a) (1).

a. Performance Objective. The organization will continuously monitor operational data, including products and services received from contractors, to identify hazards, measure the effectiveness of safety risk controls, and assess system performance.

b. Design Expectations.

(1) The organization will monitor operational data (e.g., duty logs, crew reports, work cards, process sheets, and reports from the employee safety feedback system specified in Process 3.1.6) to:

(a) Determine conformity to safety risk controls (described in Process 2.2.3);

(b) Measure the effectiveness of safety risk controls (described in Process 2.2.3);

(c) Assess SMS system performance; and

(d) Identify hazards.

(2) The organization will monitor products and services received from subcontractors.

PROCESS 3.1.2 INTERNAL AUDITS BY OPERATIONAL DEPARTMENTS.

SRR - §5.71 (a) (2).

a. Performance Objective. The organization will perform regularly scheduled internal audits of its operational processes, including those performed by contractors, to verify safety performance and evaluate the effectiveness of safety risk controls.

b. Design Expectations.

(1) Line management of operational departments will conduct regular internal audits of safety-related functions of the organization's operational processes (production system). (Note: The internal audit is a primary means of output measurement under Component 1.0b (3) (c) and (4) (e)) (§ 5.71 (a).

(2) Line management will ensure that regular audits are conducted to:

(a) Determine conformity with safety risk controls, and

(b) Assess performance of safety risk controls.

(3) Planning of the audits program will take into account:

(a) Safety criticality of the processes to be audited, and

(b) The results of previous audits.

(4) The organization will define:

(a) Audits, including:

1. Criteria,

2. Scope,

3. Frequency,

4. Method;

(b) How the auditors will be selected; and

(c) The requirement that auditors will not audit their own work.

(5) The organization will document audit procedures, to include:

(a) The responsibilities; and

(b) Expectations for:

1. Planning audits,

2. Conducting audits,

3. Reporting results,

4. Maintaining records, and

5. Auditing contractors and vendors.

PROCESS 3.1.3 INTERNAL EVALUATION.

SRR - §5.71 (a) (4).

a. Performance Objective. The organization will conduct internal evaluations of the SMS and operational processes at planned intervals, to determine that the SMS conforms to its objectives and expectations.

b. Design Expectations.

(1) The organization will conduct internal evaluations of the operational processes and the SMS at planned intervals to determine that the SMS conforms to objectives and expectations (Note: SMS output measurement is a primary control under Component 1.0b (3) (c) and (4) (e)) (§ 5.71 (a).

(2) Planning of the evaluation program will take into account:

(a) Safety criticality of the processes being evaluated, and

(b) The results of previous evaluations.

(3) The organization will define:

(a) Evaluations, including:

1. Criteria,

2. Scope,

3. Frequency, and

4. Methods;

(b) The processes used to select the evaluators; and

(c) Documented procedures, which include:

1. The responsibilities and

2. Requirements for:

a. Planning evaluations,

b. Conducting evaluations,

c. Reporting results,

d. Maintaining records, and

e. Evaluating contractors and vendors.

(4) The program will include an evaluation of the programs described in Component 1.0b (1).

(5) The person or organization performing evaluations of operational processes must be independent of the process being evaluated.

PROCESS 3.1.4 EXTERNAL AUDITING OF THE SMS.

SRR - §5.71 (a) (2).

a. Performance Objective. The organization will include the results of assessments performed by oversight (FAA) and other organizations (IOSA, IS-BAO, etc) in its analysis of data.

b. Design Expectations: The organization will include the results of oversight organization assessments, and other external audit results, in the analyses conducted as described in Process 3.1.7 (§ 5.71 (b)).

PROCESS 3.1.5 INVESTIGATION.

SRR - §5.71 (a) (5).

a. Performance Objective. The organization will establish procedures to collect data and investigate incidents, accidents, and instances of potential regulatory noncompliance to identify potential new hazards or risk control failures.

b. Design Expectations.

(1) The organization will collect data on:

(a) Incidents,

(b) Accidents, and

(c) Potential regulatory non-compliance.

(2) The organization will establish procedures to:

(a) Investigate accidents,

(b) Investigate incidents, and

(c) Investigate instances of potential regulatory non-compliance.

PROCESS 3.1.6 EMPLOYEE REPORTING AND FEEDBACK SYSTEM.

SRR - §5.71 (a) (7).

a. Performance Objective. The organization will establish and maintain a confidential employee safety reporting and feedback system. Data obtained from this system will be monitored to identify emerging hazards and to assess performance of risk controls in the operational systems.

b. Design Expectations.

(1) The organization will establish and maintain a confidential employee safety reporting and feedback system as in Component 4.0b (1) (e) (§ 5.71 (a) (7)).

(2) Employees will be encouraged to use the safety reporting and feedback system without fear of reprisal and to submit solutions/safety improvements where possible.

(3) Data from the safety reporting and feedback system will be monitored to identify emerging hazards.

(4) Data collected in the safety reporting and feedback system will be included in analyses described in Process 3.1.7 (§ 5.71 (b)).

PROCESS 3.1.7 ANALYSIS OF DATA.

SRR - §5.71 (b).

a. Performance Objective. The organization will analyze the data described in Processes 3.1.1 through 3.1.6 to assess the performance and effectiveness of risk controls in the organization's operational processes and the SMS, and to identify root causes of nonconformance's and potential new hazards.

b. Design Expectations.

(1) The organization will analyze the data described in Processes 3.1.1 through 3.1.6 to demonstrate performance and effectiveness of:

(a) Risk controls in the organization's operational processes and

(b) The SMS.

(2) Through data analysis, the organization will identify root causes of nonconformance and potential new hazards and evaluate where improvements can be made to the organizations:

(a) Operational processes and

(b) The SMS.

PROCESS 3.1.8 SYSTEM ASSESSMENT.

SRR - §5.73 Safety Performance Assessment.

a. Performance Objective. The organization will perform an assessment of the safety performance and effectiveness of risk controls, conformance to SMS expectations as stated herein, and the objectives of the safety policy.

b. Design Expectations.

(1) The organization will assess the performance and effectiveness of:

(a) Safety-related functions of operational processes against their objectives and expectations, and

(b) The SMS against its objectives and expectations.

(2) System assessments will document results that indicate a finding of:

(a) Conformity with existing safety risk control(s)/SMS expectations(s) (including regulatory requirements applicable to the SMS);

(b) Nonconformity with existing safety risk control(s)/SMS expectations(s) (including regulatory requirements applicable to the SMS); and

(c) New hazard(s) found.

(3) The SRM process will be utilized if the assessment indicates:

(a) The identification of new or potential hazards or

(b) The need for system changes.

(4) The organization will maintain records of assessments in accordance with the expectations of Element 1.5b (3) and (4) (§ 5.97).

ELEMENT 3.2 MANAGEMENT OF CHANGE.

SRR - §5.51 Accountability.

a. Performance Objective. The organization will develop and maintain a process to identify changes within the organization or its operational environment which may affect established processes and services. This process will be used to describe the arrangements to assure safety performance before implementing changes.

b. Design Expectations.

(1) The following will not be implemented until the SRM process (Component 2.0) is accomplished:

(a) New system designs,

(b) Changes to existing system designs,

(c) New operations/procedures, and

(d) Modified operations/procedures.

ELEMENT 3.3 CONTINUOUS IMPROVEMENT.

SRR - §5.75 Continuous improvement.

a. Performance Objective. The organization will develop and maintain a process to identify the causes of sub-standard safety performance, determine the implications of substandard safety performance, and eliminate or mitigate such causes.

b. Design Expectations.

(1) The organization will continuously improve SMS and safety risk control effectiveness through the use of the safety and quality policies, objectives, audit and evaluation results, analysis of data, corrective and preventive actions, and management reviews.

(2) The organization will develop safety lessons learned.

(a) Lessons learned information will be used to promote continuous improvement of safety.

(b) The organization will communicate information on safety lessons learned throughout the organization.

PROCESS 3.3.1 PREVENTIVE/CORRECTIVE ACTION.

SRR - §5.75 Continuous improvement.

a. Performance Objective. The organization will take corrective and preventive action to eliminate the causes, or potential causes of nonconformance identified during analysis, to prevent recurrence.

b. Design Expectations.

(1) The organization will develop:

(a) Corrective actions for identified nonconformities with risk controls, and

(b) Preventive actions for identified potential nonconformities with risk controls.

(2) Safety lessons learned will be considered in the development of:

(a) Corrective actions, and

(b) Preventive actions.

(3) The organization will take necessary corrective and preventive action based on the findings of investigations.

(4) The organization will prioritize and implement corrective and preventative action(s) in a timely manner.

(5) Records will be kept and maintained of the disposition and status of corrective and preventive actions.

PROCESS 3.3.2 MANAGEMENT REVIEW.

SRR - §5.25 Designation and responsibilities of required safety management personnel.

a. Performance Objective. The accountable executive will conduct regular reviews of the SMS to assess the performance and effectiveness of the organization's operational processes and the need for improvements.

b. Design Expectations.

(1) The accountable executive will conduct regular reviews of the SMS, including:

(a) The outputs of safety risk management (Component 2.0),

(b) The outputs of SA (Component 3.0), and

(c) Lessons learned (Element 3.3b (2).

(2) Management reviews will include assessing the performance and effectiveness of an organization's process designs, the implications of such, and the need for improvements of:

(a) Operational processes, and

(b) The SMS.

COMPONENT 4.0 SAFETY PROMOTION.

SRR - Part 5, Subpart E - Safety Promotion.

a. Performance Objective. The accountable executive and other members of management will promote the growth of a positive safety culture and communicate it throughout the organization.

b. General Design Expectations.

(1) The accountable executive will promote the growth of a positive safety culture by:

(a) Publication of senior management's stated commitment to safety to all employees;

(b) Visibly demonstrating their commitment to the SMS;

(c) Communicating the safety responsibilities for the organization's personnel;

(d) Clearly and regularly communicating safety policy, goals, objectives, standards, and performance to all organizational employees;

(e) Creating an effective employee reporting and feedback system that provides confidentiality;

(f) Using a safety information system that provides an accessible, efficient means to retrieve safety information; and

(g) Making essential resources available to implement and maintain the SMS.

ELEMENT 4.1 COMPETENCIES AND TRAINING.

SRR - §5.91 Competencies and Training.

a. Performance Objective. The organization will ensure that personnel are trained and competent to perform their SMS duties. The scope of safety training will be commensurate with the individual's involvement in the SMS.

b. Design Expectations. The organization will implement processes to accomplish the expectations for Processes 4.1.1 thru 4.1.2, below.

PROCESS 4.1.1 PERSONNEL EXPECTATIONS (COMPETENCE).

SRR - §5.91 Competencies and Training.

a. Performance Objective. The organization will document competency requirements for those positions identified in Element 1.2b (3) and 1.3 and ensure those requirements are met.

b. Design Expectations.

(1) The organization will determine and document competency requirements for those positions identified in Element 1.2b (3) and 1.3.

(2) The organization will ensure that those individuals in the positions identified in Element 1.2b (3) and 1.3, meet the Process 4.1.1b (1) competency requirements.

PROCESS 4.1.2 TRAINING.

SRR - §5.91 Competencies and Training.

a. Performance Objective. The organization will develop, document, deliver, and regularly evaluate training necessary to meet competency requirements of 4.1.1b (1).

b. Design Expectations.

(1) Training needed to meet competency requirements of 4.1.1b (1) will be developed for those individuals in the positions identified in Element 1.2b (3) and 1.3.

(2) Training development will consider scope, content, and frequency of training required to maintain competency for those individuals in the positions identified in Element 1.2b (3) and 1.3.

(3) Employees will receive training commensurate with their:

(a) Position level within the organization, and

(b) Impact on the safety of the organization's products or services.

(4) To ensure training currency, training will be periodically:

(a) Reviewed and

(b) Updated.

ELEMENT 4.2 COMMUNICATION AND AWARENESS.

SRR - §5.93 Safety communication.

a. Performance Objective. The accountable executive and other members of management will communicate the outputs of its SMS to its employees, and will provide its oversight organization access to SMS outputs in accordance with established agreements and disclosure programs.

b. Design Expectations.

(1) The organization will communicate safety critical outputs of the SMS, rationale behind controls, preventative or corrective actions and insure awareness of SMS objectives to its employees.

(2) The organization will provide its oversight organization access to the outputs of the SMS.

(3) The organization's SMS will be able to inter-operate with other organization's SMSs to cooperatively manage issues of mutual concern.

APPENDIX 2. COMPARISON OF SAFETY MANAGEMENT SYSTEM FRAMEWORK WITH OTHER STANDARDS

1. PURPOSE OF THIS APPENDIX. The table below is provided to assist those organizations developing and implementing an SMS. It provides a reference between existing standards and this FAA SMS Framework. It includes references to the following:

a. Quality Management Systems via International Standards Organization International Organization for Standardization (ISO) 9001:2000 and the Aerospace Basic Quality System Standard (AS 9100) requirements;

b. Environmental Management Systems via ISO 14001 requirements;

c. Occupational Safety and Health Management Systems (OHSAS) via OHSAS 18001. OHSAS 18001 is an Occupation Health and Safety Assessment Series for health and safety management systems, which was created through a concerted effort from a number of the world's leading national standards bodies, certification bodies, and specialist consultancies; and

d. FAA AC 120-92, appendix 1, current edition, clause numbers (old SMS Standard).

NOTE: The following table is intended to assist the organization SMS developers in building on existing management systems to develop the SMS and/or integrating its SMS with these existing management systems.

TABLE 1. SAFETY MANAGEMENT SYSTEM FRAMEWORK COMPARED WITH OTHER STANDARDS

Content (Standards)	FAA SMS Framework	AC 120-92 (2006, App 1)	ISO 9001: 2000/AS 9100	ISO 14001	OHSAS 18001
Purpose and Applicability	1	1	1	1	1
References (Normative)	2	2	2	2	2
Definitions	3	3	3	3	3
Functional Expectations	4	4	4	4	4
General requirements (and Responsibility/ Authority (ISO 9000))	1.0	4.1	4.1, 5.5	4.1	4.1
Policy (safety, environmental, quality)	1.0 b (4)(b), 1.1	4.0	5.1, 5.3, 8.5	4.2	4.2
Planning	1.0 b (4)(g)	4.4	5.4	4.3	4.3

Content (Standards)	FAA SMS Framework	AC 120-92 (2006, App 1)	ISO 9001: 2000/AS 9100	ISO 14001	OHSAS 18001
Requirements (hazard/risk, environmental aspects, customer requirements)	2.0, 3.2	5.0, 5.7	5.2, 7.2.1, 7.2.2	.3.1	4.3.1
Legal and other requirements, customer focus (ISO 9000)	1.0 b (4)(c), (d)	4.6	5.2, 7.2.1	4.3.2	4.3.2
Objectives and targets	1.1, 2.1.1	4.2, 5.1	5.4.1	4.3.3	4.3.3
Programs, action planning to meet targets, continuous improvement	1.0 b (4) (g), 2.2.3	4.4	5.4.2, 8.5.1	4.3.4	4.3.4
Management responsibility and organizational structure	1.2	4.5	5, 6 (Resource mgmt.)	4.4.1	4.4.1
Training	4.1.1, 4.1.2	7.3, 7.4	6.2.2	4.4.2	4.4.2
Communications	3.1.6, 3.3, 4.2	6.3.6, 6.8, 7.2	5.5.3, 7.2.3	4.4.3	4.4.3
Documentation and quality manual (ISO 9000)	1.5	4.9	4.2	4.4.4	4.4.4
Document and data control	1.5	4.9	4.2.3	4.4.5	4.4.5
Operational control and product realization	1.0 b (4)(e), (f)	4.1, 4.7	7	4.4.6	4.4.6
Emergency preparedness and response, control of nonconforming product (ISO 9000)	1.4	4.8	8.3	4.4.7	4.4.7
Performance measurement and monitoring	1.0, 3.1.1, 3.1.7, 3.1.8	6.3.1, 6.4, 6.5	8	4.5	4.5
Accidents, incidents, nonconformity,	3.1.5, 3.1.8, 3.3.1	6.3.5, 6.5, 6.6	8.3, 8.5.2, 8.5.3	4.5.2	4.5.2

Content (Standards)	FAA SMS Framework	AC 120-92 (2006, App 1)	ISO 9001: 2000/AS 9100	ISO 14001	OHSAS 18001
corrective and preventive action					
Auditing	3.1.3 - 3.1.5	6.3.2, 6.3.3, 6.3.4	8.2.2	4.5.4	4.5.4
Management review	3.3.2	6.7	5.6	4.6	4.6
Continuous Improvement	3.3	6.8	8.5.1	4.3.4	4.3.4

APPENDIX 3. SAMPLE RISK ASSESSMENT TOOLS

1. PURPOSE OF THIS APPENDIX. The table below is provided to assist those organizations developing and implementing an SMS. It provides examples of potential criteria for the severity of consequences and likelihood of occurrence that may be used by a certificate holder.

2. SEVERITY AND LIKELIHOOD CRITERIA. The definitions and final construction of the matrix is left to the certificate holder's organization to design. The definitions of each level of severity and likelihood will be defined in terms that are realistic for the operational environment. This ensures each organization's decision tools are relevant to their operations and operational environment, recognizing the extensive diversity in this area. An example of severity and likelihood definitions is shown in Table 1 below. Each operator's specific definitions for severity and likelihood may be qualitative but quantitative measures are preferable, where possible.

> **NOTE:** A matrix is not required but is a method to prioritize risk. The certificate holder must have a method to prioritize risk.

TABLE 1. SAMPLE SEVERITY AND LIKELIHOOD CRITERIA

Severity of Consequences			**Likelihood of Occurrence**		
Severity Level	Definition	Value	Likelihood Level	Definition	Value
Catastrophic	Equipment destroyed, multiple deaths	5	Frequent	Likely to occur many times	5
Hazardous	Large reduction in safety margins, physical distress or a workload such that operators cannot be relied upon to perform their tasks accurately or completely. Serious injury or death. Major equipment damage.	4	Occasional	Likely to occur sometimes	4
Major	Significant reduction in safety margins, reduction in the ability of operators to cope with adverse operating conditions as a result of an increase in workload, or as result of conditions impairing their efficiency. Serious incident. Injury to	3	Remote	Unlikely, but possible to occur	3

Severity of Consequences			Likelihood of Occurrence		
	persons.				
Minor	Nuisance. Operating limitations. Use of emergency procedures. Minor incident.	2	Improbable	Very unlikely to occur	2
Negligible	Little consequence	1	Extremely Improbable	Almost inconceivable that the event will occur	1

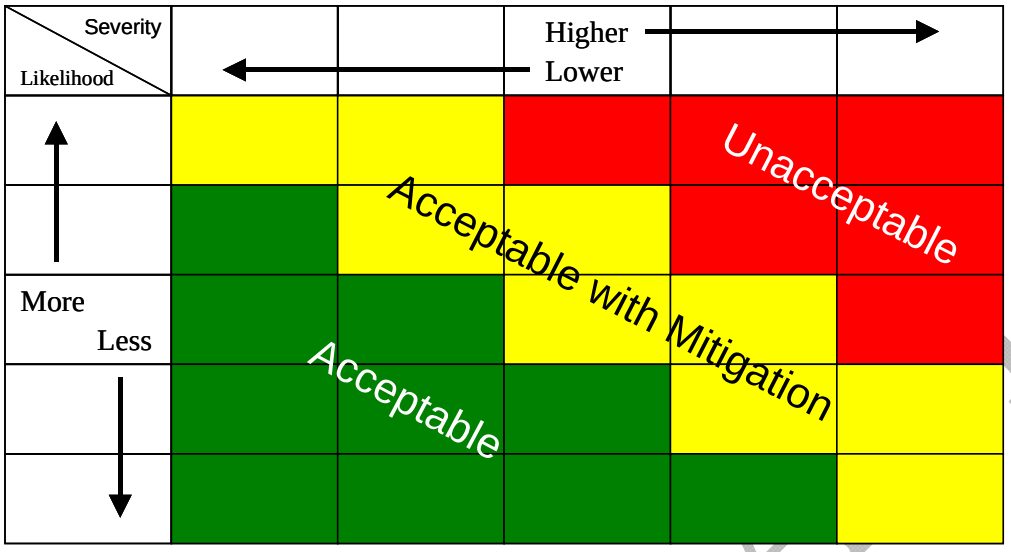
a. Risk Acceptance. In the development of its risk assessment criteria, certificate holders are expected to develop risk acceptance procedures, including acceptance criteria and designation of authority and responsibility for risk management decision making. The acceptability of risk can be evaluated using a risk matrix such as the one illustrated in Figure 1. The example matrix shows three areas of acceptability. Risk matrices may be color coded; unacceptable (red), acceptable (green), and acceptable with mitigation (yellow).

(1) Unacceptable (Red). Where combinations of severity and likelihood cause risk to fall into the red area, the risk would be assessed as unacceptable and further work would be required to design an intervention to eliminate that associated hazard or to control the factors that lead to higher risk likelihood or severity.

(2) Acceptable with Mitigation (Yellow). Where the risk assessment falls into the yellow area, the risk may be accepted under defined conditions of mitigation. An example of this situation would be an assessment of the impact of a non-operational aircraft component for inclusion on a minimum equipment list (MEL). Defining an Operational (O) or Maintenance (M) procedure in the MEL would constitute a mitigating action that could make an otherwise unacceptable risk acceptable, as long as the defined procedure was implemented. These situations may also require continued special emphasis in the SA function.

(3) Acceptable (Green). Where the assessed risk falls into the green area, it may be accepted without further action. The objective in risk management should always be to reduce risk to as low as practicable regardless of whether or not the assessment shows that it can be accepted as is. This is a fundamental principle of continuous improvement.

FIGURE1. SAFETY RISK MATRIX EXAMPLES



Example 1

Risk Likelihood		Risk Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely Improbable	1	1A	1B	1C	1D	1E

Example 2

NOTE: (The direction of higher/lower and more/less scales on a matrix is at the discretion of the organization).

b. Other Risk Assessment Tools for Flight and Operational Risk Management. Other tools can also be used for flight or operational risk assessment such as the controlled flight into terrain (CFIT), Approach and Landing Accident Reduction (ALAR), operational control, and ground operations risk assessment tools available from the Flight Safety Foundation (FSF) (http://www.flightsafety.org/technical_initiatives.html).

c. Causal Analysis. Risk analyses should concentrate not only on assigning levels of severity and likelihood but on determining why these particular levels were selected. This is referred to as *root cause analysis*, and is the first step in developing effective controls to reduce risk to lower levels. Several structured software systems are available to perform root cause analysis. However, in many cases, simple brainstorming sessions among the company's pilots, mechanics, or dispatchers other experienced subject matter experts is the most effective and affordable method of finding ways to reduce risk. This also has the advantage of involving employees who will ultimately be required to implement the controls developed.

APPENDIX 4. TABLE OF EXPECTED SAFETY MANAGEMENT SYSTEM OUTPUTS

1. PURPOSE OF THIS APPENDIX. The table below is provided to assist those organizations developing and implementing an SMS. It provides references and expected outputs for each element and process contained in appendix 1 of this advisory circular.

2. MEASUREMENTS. Each of the outputs should have a method of measurement specified by the organization in accordance with Component 1.0b (2) "SMS processes will be…measured…" Measures need not be quantitative where this is not practical. All that should be expected is some method of providing objective evidence of the attainment of the expectation.

> **NOTE:** There is a relationship between controls and process measures. That is, the internal evaluation process is the method of controlling the processes, through the associated data collection, analysis, assessment, and corrective action processes. The individual outputs are the content of the measures.

3. MANAGEMENT REVIEWS. Management reviews are the means of making sure that the appropriate levels of responsibility and authority are brought into the process and that management can be accountable in a proactive way, rather than an after-the-fact attribution.

> **NOTE: Table 1 below is a complete set of outputs, as a minimum expectation, for the content of internal evaluations of each process area.**

TABLE 1. TABLE OF EXPECTED SAFETY MANAGEMENT SYSTEM OUTPUTS

Process	Reference	Output Expectation
Component 1.0 - Safety Policy and Objectives		
This table does not apply to the first component		
Component 2.0 - Safety Risk Management		
2.1.1 System/Task Analysis	2.1.1b (1)	System descriptions for following situations:
	2.0b (2)(a)	• Initial designs of systems, organizational procedures, and products
	2.0b (2)(b)	• Development of operational procedures
	2.0b (2)(d)	• Planned Changes
2.1.2 Hazard Identification	2.1.2b (1)b)	Hazards documented
	2.1.2b (2)(a)	Hazards tracked
2.2.1 Risk Analysis	2.2.1b (1)(c)	Assignment of severity and likelihood for each hazard (as documented in 2.1.2)
2.2.2 Risk Assessment	2.2.2b (1)	Assessment of risk acceptability for each hazard (as documented in 2.1.2)
2.2.3 Risk Control	2.2.3b (1)	Risk control/mitigation plans for each hazard with an unacceptable risk (as assessed in 2.2.2)
Component 3.0 - Safety Assurance		
3.1.1 Continuous	3.1.1	Objective evidence of monitoring activities in

Process	Reference	Output Expectation
Monitoring		accordance with company policy
3.1.2 Internal Audit	3.1.2b (5)(b)(1)	Plans
	3.1.2b (5)(b)(3) & (4)	Reports/records
3.1.3 Internal Evaluation	3.1.3b (3)(d)(2)(a)	Plans
	3.1.3b (3)(d)(2) (c) & (d)	Reports/records
3.1.4 External Evaluation	3.1.4	Objective evidence of external audit findings (e.g., International Air Transport Association Operational Safety Audit (IOSA), International Business Aviation Council (IS-BAO), Air Charter Safety Foundation (ACSF), and FAA)
3.1.5 Investigations	3.1.5b (1)	Data collected (e.g. records, reports) for investigations of:
	3.1.5b (1)(a)	Incidents
	3.1.5b (1)(b)	Accidents
	3.1.5b (1)(c)	Potential regulatory violations (e.g., Voluntary Disclosure Reporting Program (VDRP) records)
3.1.6 Employee Reporting System (ERS)	3.1.6b (1)	Evidence of system (e.g. report file, log, database)
	3.1.6b (3)	Evidence of monitoring of ERS data for hazards
	3.1.6b (4)	Evidence of analysis of ERS data
3.1.7 Analysis of Data	3.1.7b 3.1.7b (1)	Objective evidence of analysis processes for each data type
3.1.8 System Assessment	3.1.8b (4)	Records of system assessments
3.3.1 Preventive/Corrective Action	3.3.1b (1)	Corrective action plans
	3.3.1b (5)	Records of disposition and status of corrective actions
3.3.2 Management Review	3.3.2b (1)	Objective evidence of management reviews (e.g., minutes, log)
Component 4.0 - Safety Promotion		
4.1.1 Competency Requirements	4.1.1b (1)	Documented competency requirements in accordance with 1.2 b(3) & 1.3b(1)
4.1.2 Training	4.1.2b (1)	Plans/requirements
	4.1.2b (3)	Records
	4.1.2b (4)	Reviews

APPENDIX 5. DETERMINING THE ACCOUNTABLE EXECUTIVE

1. PURPOSE OF THIS APPENDIX. CFR 14 §5.25 requires certificate holders to appoint an accountable executive. The discussion and tables below are provided to assist in the determination, selection and verification an accountable executive for a certificate holder.

2. What does the Accountable Executive do? The accountable executive is required to insure that the company's SMS is properly implemented and performing in all areas of the certificate holders' organization, develop and signs the certificate holder's safety policy, regularly review the safety policy, communicate the safety policy to the organization and regularly review the certificate holder's safety performance.

The organization must identify the correct person to be the accountable executive, and that this individual understands and accepts the roles and responsibilities associated with the position. This is not intended to be a position title without accountability.

3. Selecting the accountable executive. To assist the organization with the selection of their accountable executive, Figures 4 and 4A provide flow charts and series of questions. Figure 4 identifies several organizational structures that will lead to a corresponding accountable executive. The organizational structures included in Figure 4 are intended to cover the majority of situations that will be encountered. Should there be an organizational structure that does not result in the clear selection of an accountable executive; an appropriate candidate will be selected in consultation with the FAA.

4. Verifying the accountable Executive. Once the accountable executive is determined, the questions in Figure 4A will verify the selected person is the correct choice. On Figure 4A, all questions must receive a 'yes' answer for the candidate to be acceptable. Should any of the questions result in a 'no' answer, the selection process must start again with a new candidate.

The certificate holder must submit a letter to the FAA naming the accountable executive, his/her position within the company and his/her duties. The FAA will evaluate the submission and respond to the certificate holder. The accountable executive's information will be entered into Enhanced Vital Information Database (eVID).

See Figure 4 and 4A: Accountable Executive Decision Tree, below.

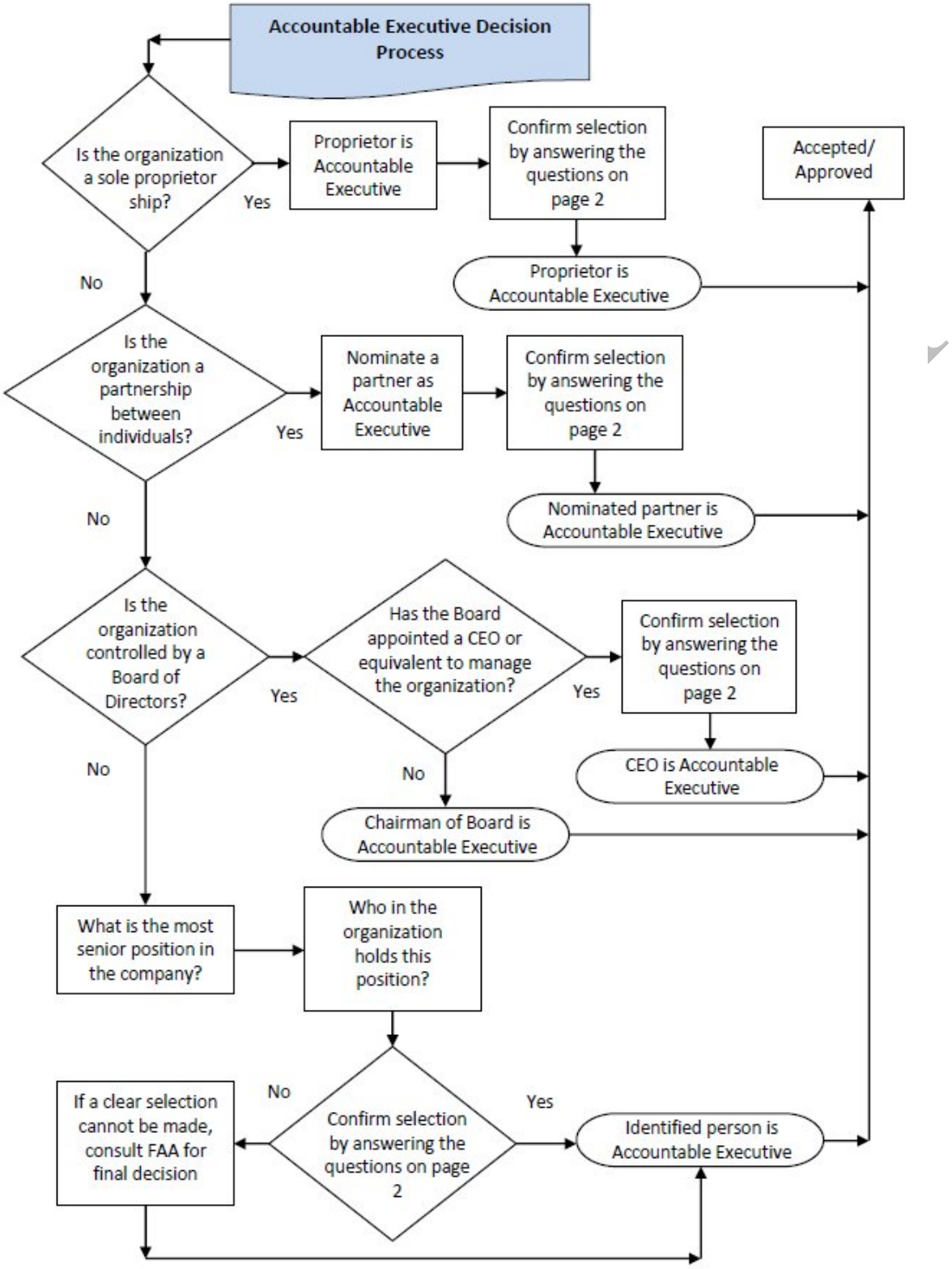


Figure 4 - Accountable Executive Decision Tree

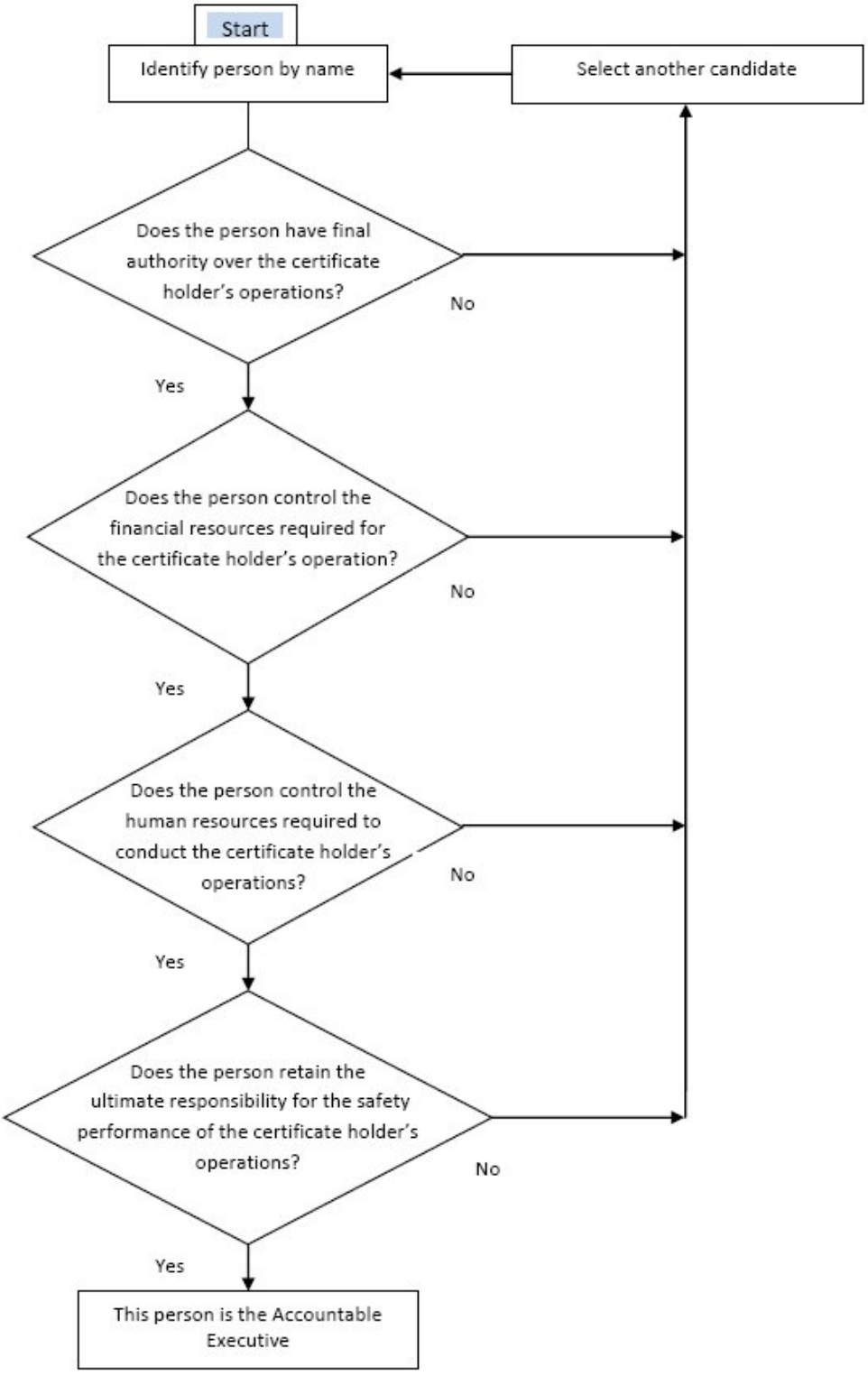


Figure 4A - Accountable Executive Decision Tree

APPENDIX 6. INTEGRATION OF EXISTING PROGRAMS INTO SMS

1. PURPOSE OF THIS APPENDIX. The FAA strongly encourages the use of required and voluntary programs in the process of safety management, particularly the use of the Continuing Analysis and Surveillance System (CASS), Internal Evaluation Program (IEP) and the Aviation Safety Action Program (ASAP). These programs, and others, have strong relationships to the SMS functions of Safety Assurance and Safety Promotion. Aviation certificate holders are encouraged to consider expanding these programs across their entire organization to develop a comprehensive systems approach to safety management. The discussion and table below are provided to assist in the integration of existing programs into an SMS.

Table 3, below, shows a correlation between the SMS Framework, the requirements of CASS, IEP, ASAP, LOSA and FOQA. The table illustrates potential overlaps between the SMS Framework and the requirements of CASS and other programs, i.e., where a component of either CASS or a voluntary program may satisfy SMS requirements. When an operator utilizes a CASS or one of these programs, the design expectations of SMS should be evaluated (Recommend the Detailed Gap Analysis Tool) to ensure the performance objectives and design expectations are being fulfilled.

2. Integration of Required Programs - CASS

Continuing Analysis and Surveillance System (CASS) is a quality assurance system that monitors and analyzes the performance and effectiveness of the Air Carrier's Continuous Airworthiness Maintenance Program (CAMP). CASS accomplishes this through surveillance, hazards identification, analysis, corrective action, and corrective action follow up.

Until present, the only method an air operator could use to evaluate the effectiveness of their CASS system was the Independent Evaluation Program (IEP), which is not regulatory (except it is required by DoD for a Defense Department contract). Now with SMS, there is a regulatory requirement. SMS should be used to evaluate the CASS or ensure that the IEP is fulfilling its control responsibility.

During the implementing of SMS; CASS should be included in the SMS process. SMS is not a substitute for CASS but a quality management tool ensuring that all the required processes within a robust CASS have been completed. Conversely, CASS may satisfy many SMS requirements for maintenance operations within the organization. CASS should not be a stand-alone system, but rather a subsystem within SMS, and can either be built into the organizations SMS or maintained separately and assessed by the SMS. Either way it is accomplished, it is imperative to understand that CASS should supply data to the SMS. SMS may even support CASS through the use of Safety Risk Management (SRM) and Safety Assurance (SA) processes applied to CASS needs.

SMS should be instrumental in the evaluation of CASS by asking questions necessary to determine if the operator's CASS is effective and efficient, and if there are opportunities for improvement. This is accomplished by ensuring that an Analysis of Data (AOD) is performed on identified hazards as a result of collecting audit and operational data as well as the

Independent Evaluation Program (IEP), if implemented. The SMS should ensure that the AOD accomplishes trend analysis, looking for trend patterns, and taking corrective action at the highest level to ensure hazards and risks are removed or mitigated to the lowest possible level. SMS should not only manage the corrective action, but also who was part of the decision making process, and the factors that determined the corrective action.

Enhancing the CASS decision making process, the certificate holder's SMS should utilize the Safety Assurance (SA) process for performance management; and the Safety Risk Management (SRM) process, for design management. During SA system assessment, performance is evaluated to determine if the hazard is a result of insufficient policy or procedures which would affect control (design), or if adequate policies and procedures are in place, and not being followed (performance). If the hazard is identified to be a performance issue, the SA process can be used for preventative or corrective action. However, if the evaluation leads to a design problem then the SRM process must be followed to evaluate current policies and procedures and revise as necessary to provide adequate control.

During a design change, company policies and or procedures are revised to ensure the operational process is clear and concise, so that the desired outcomes are achieved. During this process it is essential to ensure that upper level management with authority to accept and approve policy changes are part of the decision making process.

The SA and SRM work flow processes also enables a feedback loop not addressed in the CASS. The feedback loop ensures that any changes in performance (SA) or design (SRM) as a result of a corrective action or control does not countermand or interfere with another process, or introduce other latent or active hazards.

SMS must evaluate the CASS to ensure all critical CASS elements are being performed, controlled and outcomes are acceptable, in accordance with FAA Order 8900.1 Volume 3, Chapter 44, "Assess Continuing Analysis and Surveillance System for Parts 121 and 135," and the latest version of AC 120-79, "Developing and Implementing an Air Carrier CASS".

3. Integration of Voluntary Programs

a. Voluntary Programs and the SMS. The FAA strongly encourages the use of voluntary programs in the process of safety management, particularly the use of the Internal Evaluation Program (IEP) and the Aviation Safety Action Program (ASAP). Both of these programs have strong relationships to the SMS functions of SA and Safety Promotion. Certificate holders are encouraged to consider expanding these programs across their entire organization to develop a comprehensive systems approach to safety management.

Most part 121 certificate holders and their employee groups participate in several of the FAA's voluntary safety programs, and the operator should utilize these programs to satisfy a number of SMS requirements.

In addition to its many regulatory programs, the FAA also supports a portfolio of voluntary safety programs, which encourage certificate holders to exceed the minimum safety standards commonly associated with the regulatory programs. The Flight Standards Service currently supports four reporting programs (the Aviation Safety Reporting System-ASRS, the Aviation

Safety Action Program-ASAP, the Flight Operations Quality Assurance program-FOQA and the Voluntary Disclosure Reporting Program-VDRP), two auditing programs (the Internal Evaluation Program-IEP and the Line Operational Safety Audit program-LOSA) and one training program (the Advanced Qualification Program-AQP). These seven partnership programs all involve the collection and analysis of safety data resulting in corrective actions to address safety shortfalls.

Certificate holders are encouraged to be creative in utilizing these voluntary programs to meet the specifications of the SMS rule. All of these programs collect data on the performance of the safety system, so most can be used to help satisfy some of the safety assurance requirement.

b. Voluntary Safety Programs (VSP) and the Freedom of Information Act (FOIA). Under part 193, the FAA may issue an order designating such information as protected from disclosure under FOIA. But the FAA must first issue such an order, and it cannot do so until it has published the proposed Designation in the Federal Register and solicited public comment. The final order of designation, if issued, must address any public objections in its final order. Data or information that does not qualify as "voluntarily submitted safety related data" can only be protected under FOIA if it qualifies under one or more of the exemptions from FOIA. There are 9 FOIA exemptions under part193, the most relevant exemption for VSP's and SMS is:

> Exemption 4: Trade secrets or commercial or financial information that is privileged or confidential and submitted to the agency by any person;
>
> **(1) Taken program by program:**
>
> AQP training data - Exemption 4 may apply.
> ASAP reports are protected by FAR part 193 and FAA order 8000.82.
> FOQA data is protected under FAR part 193 and FAA order 8000.1.
> VDRP report data is protected under FAR part 193 and FAA order 8000.89.
> ASRS is protected by FAR §91.25, and FAA confidentiality agreements with NASA.
> IEP - this audit data is not currently submitted to the FAA, and may be protected under Exemption 4.
> LOSA - this audit data is not currently submitted to the FAA, and may be protected under Exemption 4.

(2) Any VSP is protected by part 193, when an FAA order specifically designates it as protected. Data or information that does not qualify as "voluntarily submitted safety related data" can only be protected under FOIA if it qualifies under one or more of the exemptions from FOIA.

c. Correlation summary between SMS and the voluntary, existing regulatory, and quasi-required programs.

- CASS is required by §121.373. It overlaps on some of the SMS SA functions (§5.71)
- ASAP and FOQA are programs that can be approved by FAA but are not required. These programs can be used to satisfy some SMS requirements (§ 5.71).

- LOSA is the subject of AC120-90, Line Operations Safety Audits. A LOSA program is not formally approved or accepted by FAA. A LOSA program could be used to satisfy part of the internal audit requirements of SMS (§5.71).

- IEP is the subject of AC 120-59, Air Carrier Internal Evaluation Program and AC 145-5, Repair Station Internal Evaluation Programs. An IEP is not approved or accepted by the FAA (no approval or acceptance process). If an operator desires to have a DoD contract they will be required by the DoD to have an IEP. An IEP will satisfy the internal evaluation requirement of §5.71

The data basis for the voluntary programs meets part of the requirements for an SMS. Below is a summary discussion of the various programs and where they do/do not meet the requirements and how the data meets the SMS standards. Further discussion of each program follows:

(1) ASAP requires analysis and corrective action. It does not, however, require analysis of patterns or trends across reports that would identify systemic problems. We tend to fix the employee but not the system. Technically, this type of trend analysis is not required by AC 120-66 but is highly recommended if the system accomplished the objective of assurance or the performance and effectiveness of risk controls. Of course, the coverage of ASAPs depends on how many employee groups are covered by ASAP programs. Employee groups not covered by an ASAP would need to have some other type of confidential employee reporting system. Also, an operator would need to maintain a "backup" program to remain in compliance if their collective bargaining agreement (CBA) allowed for the union to opt out of the program.

(2) FOQA requires data collection and analysis but stops short of requiring corrective action. Thus, this requirement would be dependent on the configuration of the specific operator's program - a subject of the gap analysis.

(3) IEP. Since an Internal Evaluation Program is not covered by a regulation or formal voluntary program approval process, an IEP would be totally dependent on the configuration - again, a subject for gap analysis. A program that includes all of the processes of AC 120-59 should cover internal evaluation and associated analysis, assessment, and corrective action processes, to be verified by the gap analysis.

(4) LOSA. Line Orientated Safety Audit has the least connection with established processes. A LOSA could be part of the flight operations' internal audit process. A Gap analysis would be required to insure that it meet the SMS standard.

Below is an extensive baseline correlation between SMS and the voluntary, existing regulatory and quasi-required programs.

> **Note:** Table 3 may be used as guidance in mapping the processes in the certificate holder's CASS to the processes required in a robust SMS. The table is only a quick reference guide. For definitive analysis, the operator should complete a detailed gap analysis (SMS Implementation Guide, Appendix 6) to identify gaps, or missing processes between the certificate holder's CASS and SMS.

It is understood that CASS is not expected to perform Analysis of Data in areas outside of maintenance / inspection and that CASS may not perform complete analysis of data throughout the Safety Assurance Component. During implementation of SMS and when performing the detailed gap analysis (explained in Appendix 7) on processes 3.1.1, 3.1.4, 3.1.5, and 3.1.6 it is important to ensure that the processes within CASS meet the design expectations of SMS.

CASS should also have clear guidance ensuring that any new hazards identified during the System Assessment Process (3.1.8) should go through the SRM process.

When the detailed gap analysis finds gaps within the certificate holder's CASS, the CASS program must be revised, or the missing processes should be part of the certificate holder's SMS.

Table 3 - Safety Management Requirements Baseline Correlation Matrix

Safety Management Requirements Baseline Correlation Matrix

SMS	CASS*	IEP	ASAP	LOSA	FOQA
1. Safety policy and objectives					
1.1 - Safety Policy					
1.2 Management Commitment and Safety accountabilities					
1.3 Key Safety Personnel					
1.4 Emergency Preparedness and Response					
1.5 SMS Documentation and Records					
2. Safety risk management					
2.1 Hazard Identification and Analysis					
2.1.1 System Description and Task Analysis					
2.1.2 Identify Hazards					
2.2 Safety Risk Assessment and Control					
2.2.1 Analyze Safety Risk					
2.2.2 Assess Safety Risk					
2.2.3 Control/Mitigate Safety Risk					
3. Safety assurance					
3.1 Safety Performance Monitoring and Measurement					
3.1.1 Continuous Monitoring**	X***	X			
3.1.2 Internal Audits by Operational Departments**	X			X	X
3.1.3 Internal Evaluation**		X			
3.1.4 External Auditing of the SMS**	X				
3.1.5 Investigation**	X		X		
3.1.6 Employee Reporting and Feedback System**			X		
3.1.7 Analysis of Data**	X***	X	X	X	X
3.1.8 System Assessment**	X	X			
3.2 Management of change**		X			
3.3 Continuous Improvement	X				
3.3.1 Preventive/Corrective Action**	X	X	X		
3.3.2 Management review**		X			
4. Safety promotion					
4.1 Competencies and Training					
4.1.1 Personnel Expectations (Competence)					
4.1.2 Training					
4.2 Communication and Awareness					

*Maintenance and Inspection Programs (Systems/Processes) only
** Possible Overlap
*** Limited

4. Voluntary Safety Programs:

a. Aviation Safety Action Program (ASAP). The goal of the Aviation Safety Action Program is to encourage voluntary reporting of safety issues and events that come to the attention of employees of participating certificate holders. ASAP program development, implementation, approval, and operation are covered in AC 120-66.

To encourage an employee to voluntarily report safety issues even though they may involve an alleged violation of Title 14 of the Code of Federal Regulations (14 CFR), enforcement-related incentives have been designed into the program. An ASAP is based on a safety partnership that will include the Federal Aviation Administration (FAA) and the certificate holder, and may include any third party such as the employee's labor organization.

ASAP programs include processes for intake of data from employees, analysis of the data, and development of corrective actions. Each ASAP has an Event Review Committees (ERC) to conduct these activities. The ERC has members from the carrier's management, the FAA certificate management organization (e.g. CMO, FSDO, etc.) and, where applicable, the employee group's union. Typically, a separate ERC is organized for each employee group, partly due to different unions representing each group. The ASAP considers each ASAP report for acceptance or denial (according to predetermined criteria) and subsequently analyzes, then, with the reporter's participation, recommends action.

The ASAP program can be used to satisfy the requirement for a confidential reporting system, but only in part. It was designed for pilots, flight attendants, dispatchers and maintenance personnel, and not for the entire certificate holder's workforce. The certificate holder may elect a less complex and expensive solution for its' remaining employees, more along the lines of a suggestion box or anonymous on-line reporting software, whose contents are reviewed by upper management on a regular basis and acted upon as required.

The SMS regulation includes a requirement for a confidential employee reporting system, as well as analysis, system performance assessment, and corrective action processes to support them. ASAP would be considered an acceptable means of compliance with this provision for the employee groups covered by the ASAP. It should be noted that the FAA does not intend to mandate ASAP, the SMS rule does contain provisions for an equivalent function that provides a means of communicating employee safety concerns and establishes requirements for action on these reports. At the same time, the rule and its associated guidance for implementation will allow operators who do have ASAP programs to integrate them into the SMS without duplication.

FAA Order 8000.82 designates information received by the agency from an Aviation Safety Action Program (ASAP) as protected from public disclosure in accordance with the provisions of part 193.

b. Aviation Safety Reporting System (ASRS). The FAA Aviation Safety Reporting System (ASRS) utilizes the National Aeronautics and Space Administration (NASA) as a third party to receive aviation safety reports. ASRS does not provide an explicit requirement for corrective actions nor does it provide sufficient detailed data with which to adequately analyze specific systems or processes. Although ASRS issues "Alerts" to the FAA, to manufacturers, and other organizations such as airport operators on safety issues identified through analysis of submitted ASRS reports, there is insufficient information for a certificate holder to take preventative or corrective action. Therefore, ASRS is of limited use to an SMS.

- Additional information on these policies can be obtained in AC 00-46D.

c. Flight Operational Quality Assurance (FOQA). FOQA is a voluntary program for the routine collection and analysis of digital flight data generated during aircraft operations. FOQA programs provide more information about, and greater insight into, the total flight operations environment. FOQA data is unique because it can provide objective information that is not available through other methods. A FOQA program can identify operational situations in which there is increased risk, allowing the operator to take early corrective action before that risk

results in an incident or accident. FOQA, if present, must interface and be coordinated with the operator's other safety programs and their SMS. The FOQA program is another tool in the operator's SMS which monitors operational data, provides system assessment and prepares preventive/corrective actions. As with the other voluntary reporting programs the FAA does not intend for certificate holders to develop a program to satisfy SMS requirements. However if a voluntary program is already present, safety information gained through the program should be used to interface with the SMS Safety Assurance process. FOQA program development, implementation, approval, and operation are covered in AC 120-82.

d. Voluntary Disclosure Reporting Program (VDRP). VDRP provides incentives for a certificate holder to voluntarily identify, report, and correct instances of regulatory noncompliance. The program allows the FAA to oversee and participate in the root-case analysis of the events leading to the violations. The FAA reviews, approves, and oversees corrective actions and conducts follow-up surveillance. The agency accepts the voluntary disclosure, foregoes legal enforcement action, and protects the public release of qualifying disclosures and corrective actions when specific criteria are met.

While VDRP data is not normally the source of safety information, the data gathered during investigation of the event, subsequent development of a comprehensive fix and schedule of implementation should be integrated into the data analysis, assessment and validation processes of the carrier's SMS Safety Assurance processes. Additional information on the VDRP can be obtained in AC 00-58A.

e. Internal Evaluation Program (IEP). The FAA presently encourages (and the DoD requires) an IEP to increase awareness of company management and all employees of their responsibility to adhere to best safety practices, and to also engage in continuous compliance with all regulatory requirements. An Internal Evaluation Program is a fundamental process of the Safety Assurance component of SMS. Each IEP will clearly identify who is responsible for the quality of the IEP, and delineate who is responsible for accomplishing the program.

IEP's should be a continuous process that includes the inspections, audits, and evaluations to assess the adequacy of managerial controls and processes in critical safety systems and to continuously improve those systems based upon results of regular evaluation. These are the same objectives as the SMS Safety Assurance process. It is encouraged that the IEP will be integrated directly into the Certificate Holder's SMS. Additional information on IEPs can be obtained in AC 120-59A.

f. Line Operations Safety Audit(LOSA). LOSA is a formal process that requires expert and highly trained observers to ride the jumpseat during regularly scheduled flights to collect safety-related data on environmental conditions, operational complexity, and flight crew performance. Confidential data collection and non-jeopardy assurance for pilots are fundamental to the process.

LOSA is distinct from - but complementary to - other proactive safety programs such as electronic data acquisition systems (e.g., FOQA), and voluntary reporting systems (e.g., ASAP). However, these programs have two major conceptual differences.

1. FOQA and ASAP rely on outcomes to generate data. For FOQA, it is flight Parameters, TCAS data, etc.; for ASAP, it is adverse events that crews report. By contrast, LOSA samples all activities in normal operations.

2. ASAP reports provide insight into why events occur as seen from the crew's perspective. By contrast, LOSA provides a "neutral, third-party perspective" in that LOSA observer's record contextual and flight crew data.

While the Federal Aviation Administration (FAA) encourages airlines to voluntarily conduct LOSA programs in the interest of safety improvement, LOSA does not entail any requirement for FAA approval, acceptance, or monitoring. While an airline may elect to share the results of a LOSA with the FAA, there is currently no requirement to do so. LOSA results, however, if present, should be included in the data acquisition process of the SMS Safety Assurance component.

g. Advanced Qualification Program (AQP). The AQP is a systematic methodology for developing the content of training programs for air carrier crewmembers and dispatchers. It replaces programmed hours with proficiency-based training and evaluation derived from a detailed job task analysis that includes crew resource management (CRM). AQP incorporates data-driven quality control processes for validating and maintaining the effectiveness of curriculum content. AQP provides an alternate method of qualifying and certifying, if required, pilots, flight engineers, flight attendants, aircraft dispatchers, instructors, evaluators, and other operations personnel subject to the training and evaluation requirements of part121.

Like ASAP, the AQP program can be used to satisfy the requirement for SMS continuous monitoring, but only in part. It was designed for specific employee groups but not for the entire certificate holder's workforce. The certificate holder may elect use or develop an AQP program or not based upon their unique operational complexities. As an added benefit, AQP may be used to augment not only the SA process, but the SRM process as well since AQP includes system analysis as a component part.

APPENDIX 7. SMS IMPLEMENTATION PROCESS

1. PURPOSE OF THIS APPENDIX. To provide standardization and a uniform set of expectations for SMS implementation by certificate holders and certificate applicants.

2. General
There are two scenarios for implementing Safety Management Systems. The first is for a new certification and the second is for an established air carrier. In both cases the implementation plan will be submitted to the FAA CHDO for approval (with assistance from the SMS Program Office). The organization will have a full up and running SMS when it completes the SMS Proactive Level (Level 3). At this time the operators SMS will meet the standards in title 14 CFR, part 5 and AC 120-92NPRM.

a. New Applicant: The new certificate applicant must plan and design their company organization using the SRM process, as they are building the company and as they write their manuals. This means that the applicant must have their SRM processes designed, planned and put into operation evaluating every part of the company, as they are building it. Initially, the SRM process will probably be run by the company designers and planners.

For example, the organizers, designers and planners, initially very few individuals, might determine that they need a business plan to show perspective financiers what the new company will look like. Then they might identify the need for an operations section, a maintenance section, a flight section, etc. For each section, for example the operations section, the planners would design what the section we needs to do, i.e., process A, process B, process C, etc. Applying the SRM process, they would ask "In process A, what are the hazards, would the hazards be a risk to our operation, is the risk acceptable and if not, how can we design out the risk or design in a control to mitigate the risk?" Once they have documented the process, they have applied SRM to the design of their operations section. Later, they may have staff managers and others to take over the SRM process, but initially the organizers, designers and planners will use SRM to design the company.

b. Established Certificate Holder: An established carrier will already have systems in place and they may have parts of a Safety Management System in their current system. In this case the company will need to analyze their current systems and compare them to the SMS Framework in AC 120-92NPRM, Appendix 1. This process is called a Gap Analysis, the "gaps" being those elements in the Framework that are not already being performed. They will develop an implementation plan based on their gap analysis. The certificate holder will be required within 6 months of the effective date of the final rule, to show how they intend to implement an SMS within 3 years by submitting their implementation plan to the CHDO.

Whether a new certification or established carrier, there are four levels in developing the organization's Safety Management System. These levels are (1) the Planning level, (2) the Reactive level, (3) the Proactive level and (4) the Continuous Improvement level. The company may chose any sequence of events across their operational processes, divisions, departments or other organizational elements to achieve final implementation as long as they are able to meet

the [date – 3 years from issuance of final SMS rule] deadline for implementation. For example, a carrier may choose to work though the levels with all operational departments, divisions, or functions simultaneously. Alternatively, the carrier may elect to fully implement SMS processes one division at a time. Whatever sequence is chosen, it must be detailed in the organization's implementation plan. Carriers and CHDOs should, however, remember that the objective is to develop an integrated, comprehensive SMS for the entire organization.

3. Phased Implementation - Four Levels

Note: Orientation and Commitment, "0", in Figure 1 below, is an information process and not considered an actual "level"; it is a time for the operator to gather information on SMS.

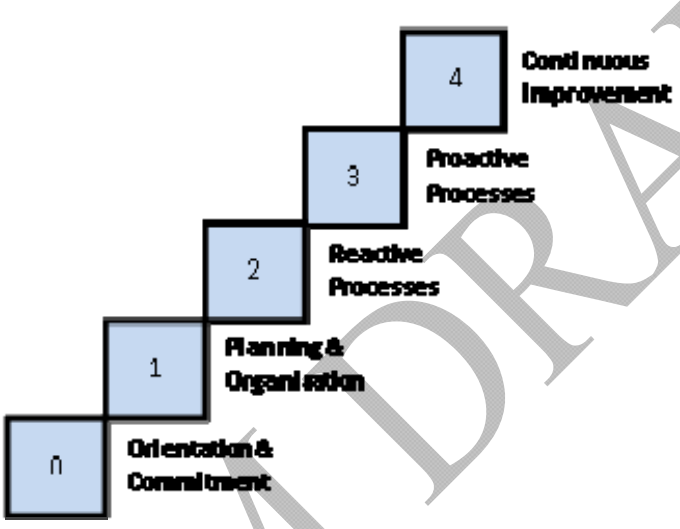


Figure 1 - Levels of SMS Implementation

a. Level One: Planning and Organization. For both implementation scenario's, Level 1 begins when a Certificate holder's Accountable Executive commits to providing the resources necessary for full implementation of SMS throughout the organization. The two principal activities that make up level one are the Gap Analysis and the Implementation plan. (Both activities are discussed in detail in AC 120-NPRM, Appendix 8). The Gap Analysis is the analysis of the program versus the SMS Standards. The Implementation Plan is simply a "road map" describing how the Aviation Certificate holder intends to close the existing gaps by meeting the objectives and expectations in the SMS Framework.

(1) Gap Analysis: The first step in developing an SMS is for the organization to analyze its existing programs, systems, and activities with respect to the SMS design expectations found in the SMS Framework. This analysis is a process and is called a "gap analysis," the "gaps" being those elements in the SMS Framework that are not already being performed by the applicant or certificate holder.

(2) Implementation Plan: Once the detailed gap analysis has been performed, an Implementation Plan is prepared. The Implementation Plan is simply a "road map" describing

how the applicant or certificate holder intends to close the existing gaps by meeting the objectives and expectations in the SMS Framework.

b. Level Two: Reactive Processes. At this level, the certificate holder develops and implements a basic Safety Risk Management (SRM) process. Information acquisition, processing, and analysis functions are implemented and a tracking system for risk control and corrective actions are established. This allows the organization to address problems as they occur and develop appropriate remedial action. For this reason, this level is termed "reactive."

c. Level Three: Proactive Processes. (A fully functional SMS) Component 2.0 of the SMS Framework (AC 120-92NPRM, Appendix 1) expects SRM to be applied to initial design of systems, processes, organizations, and products, development of operational procedures, and planned changes to operational processes. The risk management process developed at level two is used to analyze, document, and track these activities. Because the organization is now using the processes to look ahead, this level is termed "proactive." In this phase, however, these proactive processes have been implemented but their performance has not yet been proven.

d. Level Four: Continuous Improvement. The final level of SMS maturity is the continuous improvement level. Processes have been in place and their performance and effectiveness have been verified. The complete Safety Assurance process, including continuous monitoring and the remaining features of the other SRM and SA processes are functioning. A major objective of a successful SMS is to attain and maintain this continuous improvement status for the life of the organization.

4. SMS Implementation for Initial Certification. At the initial stages of a company's development the initial designers need to use the Safety Risk Management Process to build the company. The initial designers of the company define the company's goals and general plan (AKA Business Plan); this then becomes the basic system description for SRM. The initial designers then use the SRM process to identify potential hazards, analyze and assess risk and incorporate risk controls into both their business and SMS Implementation Plans. As they continue to design the business, they assess and control potential risk as they organize and develop the company. As the company is built, the Implementation Plan is built into the Certification Plan; therefore, operational systems subsystems, company organization, lines of authority, contract arrangements, etc. are analyzed by both their business plan and their implementation plan.

The first step in the application process is to insure that the applicant is prepared and knowledgeable of what a safety management system involves. As part of Pre-Application activities the applicant will complete a Level 1 orientation including the Preliminary Gap Analysis process. If the applicant has started to develop its systems, this will be a check on how those systems compare to the SMS Framework. The applicant must submit, as part of the formal application package, their Detailed Gap Analysis, Implementation Plan and meet the expectations of a Level 1 exit (SMS Implementation Guide, Appendix 1).

5. SMS Approval for Initial Certification. The CHDO, in coordination with the Flight Standards SMS Program Office will approve the implementation plan using the Level 1 Exit Criteria Worksheet found at the end of Appendix 1, AC 120-92NPRM. The Certification Team

will validate the implementation/certification plan using the Certification Process Document (CPD). When the company manuals are submitted to the Certification team, the applicant must show evidence that they developed their systems using their Safety Risk Management process.

The certification team will evaluate the applicant's Safety Management System to ensure an SMS that conforms to the standards in title 14 part 5 and expectations in AC 120-92NPRM. The company will not progress beyond the Certification Process Document Gate 2 unless their Safety Management System meets the expectations that are defined in AC 120-92NPRM, and that the Detailed Gap Analysis is updated with a minimum assessment level of "Documented" in the Detailed Gap Analysis. The certification team will use the Level 2 Exit Criteria Worksheet found at the end of Appendix 1, SMS Implementation Guide.

As the applicant progresses to Certification Process Document (CPD) Phase 3 – Performance Assessment, they will start to implement the remainder of their Safety Management System. The Detailed Gap Analysis will be updated to reflect the current status of the SMS. The applicant will assess their operating systems using their newly implemented Safety Performance Monitoring and Measurement processes and the results will be submitted to the certification team. The company will ensure that all concerns found during the assessment have been properly addressed. The certification team will test the SMS to determine that the company's SMS meets the objectives of Part 5 and AC 120-92NPRM.

Once the FAA has established that the applicant SMS meets the requirements for Level 3 Exit, as outlined in SMS Implementation Guide, their safety management procedures will be accepted by the FAA. After an operator is certified, they will have their SMS Processes in place and their performance and effectiveness will have been verified.

6. SMS Implementation for Certificate Holder's Transitioning to SMS. The second scenario is for an established certificate holder to implement a Safety Management System. The certificate holder should expect to complete the process in 36 months. The operator will progress through the four levels that are described above. After completing Level 3, the Proactive Processes, the carrier will have a complete Safety Management System.

The first step in developing an SMS is for the certificate holder to analyze its existing programs, systems, and activities with respect to the SMS functional expectations found in the SMS Framework (AC 120-92NPRM, Appendix 1). This analysis is called a "gap analysis," The operator will complete both the Gap Analysis processes described in SMS Implementation Guide, Appendix 5 and 6 and summarized below:

• The "Preliminary Gap Analysis" process is performed onsite with the assistance of the Implementation Support Team (IST), the certificate holder's management and the FAA CMT. The preliminary gap analysis represents a "snapshot", a high level subjective analysis of where the certificate holder stands at that time with respect to the SMS Framework.

• The "Detailed Gap Analysis" process is an in-depth process and is performed by the certificate holder (with the involvement of the company's FAA CMT). It is a comprehensive and thorough assessment of each program, process and control of the organization as compared to the standards and objectives of the SMS Framework. Depending upon the size and complexity

of the organization, the detailed gap analysis may take 4 to 6 months to complete. The detailed gap analysis is a "living" process and will be continuously updated as SMS implementation progresses.

a. Implementation Plan. Once the detailed gap analysis has been performed, an implementation plan is prepared. The implementation plan is simply a "road map" describing how the certificate holder intends to close the existing gaps by meeting the standards and objectives of the SMS Framework.

(1) While only three actual development activities are expected during level one, the certificate holder organizes resources, assigns responsibilities, sets schedules and defines objectives necessary to address all gaps identified.

(2) It should be noted that at each level of implementation, accountable executive's approval of the implementation plan must include allocation of necessary resources IAW SMS Framework Element 1.2 b (2) and §5.21 (a) (3).

b. Implementation Level Two: Reactive Process. At level two, the certificate holder develops and implements a basic SRM process. Information acquisition, processing, and analysis functions are implemented and a tracking system for risk control and corrective actions are established. At this level, the certificate holder corrects known deficiencies in safety management practices and operational processes; develops an awareness of hazards and responds with appropriate systematic application of preventative or corrective actions. For this reason, this level is termed "reactive." This will include complying with the requirements in SMS Implementation Guide, Appendix 2.

c. Implementation Level Three: Proactive Processes, (Fully-Functioning SMS). Component 2.0 b (2) (a), of the SMS Framework expects the certificate holder to apply its SRM process to initial design of systems, processes, organizations, and products; development of operational procedures and planned changes to operational processes. The certificate holder is now using the SMS to look ahead, thus this level is termed "proactive". However, even though these proactive processes have been implemented, their performance has not yet been proven. This level will include complying with the requirements in SMS Implementation Guide, Appendix 3.

d. Implementation Level Four: Continuous Improvement. The final level of SMS maturity is the continuous improvement level. SMS processes have been in place and their performance and effectiveness have been verified. The complete SA process, including continuous monitoring and the remaining features of the other SRM and SA processes are functioning. Level 4 will continue for the life of the organization.

7. SMS Approval for Transitioning Certificate holders

a. Scope. It is recognized that complete implementation of an SMS at a larger and more complex organization may take as long as 3 years to ensure that all aspects of the system is in place across all departments of the organization. The intent is to allow certificate holders to implement an SMS in phases, in a standardized manner and to allow validation and acceptance at each level of implementation.

b. Letter of Acceptance. Upon successful completion of each level, the certificate holder will receive a "Letter of Acceptance" which will document their completion of the levels in the development of their SMS. The Letter of Acceptance will be signed by the CMT Management Team, and will be issued to the certificate holder.

c. Levels of Participation. There are three levels in implementing a Safety Management System. Each certificate holder may develop their SMS in a modular fashion across their departments or across all their departments at the same time, However, the attainment of the implementation levels shown below are based on a comprehensive system covering the entire organization.

(1) SMS Level One: This level will be validated when a certificate holder demonstrates that they have successfully conducted a thorough preliminary and detailed gap analysis, implemented the processes corresponding to level 1 of AC 120 NPRM, Appendix 1, developed a comprehensive implementation plan. Refer to the Advisory Circular Level 1 exit check list for guidelines.

(2) SMS Level Two: This level will be validated when a certificate holder demonstrates that they have successfully implemented the processes corresponding to level 2 of AC 120-92NPRM, Appendix 2. Objective evidence will be required that SRM processes and procedures have been applied to at least one existing hazard and that the mitigation process has been initiated.

(3) SMS Level Three: This level will be validated when a certificate holder demonstrates that they have successfully implemented the processes corresponding with level 3 of AC 120-92NPRM, Appendix 3, and that the performance of these processes has been demonstrated in a performance review conducted by the CMT. This includes all training for the SMS staff and employee personnel of the organization. At this level, the certificate holder is considered to have a fully instituted SMS, however the performance and effectiveness of the SMS processes have not been validated for continued system effectiveness.

(4) SMS Level Four: The final level of SMS maturity is the continuous improvement level. Complete SMS processes have been in place and their performance and effectiveness has been verified. There is no validation of level 4 as the certificate holder is expected to attain and maintain level 4 status for the life of the organization.

d. Validation: The CHDO, in coordination with the Flight Standards SMS Program Office will conduct validation activities to assure that the certificate holder's SMS is being developed in accordance with the approved implementation plan and that it meets the requirements of 14 CFR part 5 and AC 120-92NPRM. The CHDO will coordinate intermediate validation events at least upon completion each of levels one though four, when all organizational elements are deemed to be at that level. Additional intermediate validation events may be planned as necessary or desired by the CHDO or may be requested by the carrier. The purpose of these intermediate events is to assure that the certificate holder is making adequate progress toward full implementation and that they are receiving feedback to assist them from the CHDO and the SMS Program Office.

APPENDIX 8. SMS GAP ANALYSIS

1. PURPOSE OF THIS APPENDIX. To assist in the understanding of a gap analysis process. An initial step in development of the SMS is for a certificate holder or certificate applicant to analyze its existing programs, systems, and activities with respect to the SMS performance objectives and design expectations found in this Advisory Circular, Appendix 1. This analysis process is called a "gap analysis," the "gaps" being those items in the SMS Framework that are not already being performed and documented by the certificate holder.

2. Gap Analysis Process

a. Two types of gap analysis processes are preformed:

(1) Preliminary Gap Analysis: The first type of analysis is a Preliminary Gap Analysis process. It provides a high level assessment, or "off the top of the head" judgment by company officials to get an initial indication of where the company stands with respect to the SMS Framework expectations.

The preliminary gap analysis also provides an opportunity for discussion, with Implementation Support Team support, of how each element applies to the particular service provider.

The preliminary gap analysis is accomplished at the "Performance Objective" level for each component, element and process contained within the SMS Framework.

It is recommended that the Preliminary Gap Analysis Tool (available at: http://www.faa.gov/about/initiatives/sms/specifics_by_aviation_industry_type/air_operators/) be used to record this activity; however the company may elect to use another tool that captures all of the expected material.

(2) Detailed Gap Analysis: The second type of analysis is a Detailed Gap Analysis process which is a much more in-depth analysis performed by the company. The purpose of the detailed gap analysis is to determine what is already in place and to provide a basis for further implementation planning. It is a detailed look at each expectation of the SMS Framework.

The Detailed Gap Analysis Tool is a spreadsheet that converts the SMS Framework into simple electronic or printed-paper forms to assist in the analysis of all functional expectations of a SMS.

During the detailed gap analysis, it is necessary to fully assess all company organizational and functional areas and all elements contained within the SMS Framework in order to develop a comprehensive implementation plan. For those elements of the SMS Framework that are deemed to have been already developed, the company should provide objective evidence of their accomplishment. Objective evidence may take the form of physical or electronic documents, manual references, training material, records, interviews, observations, correspondence (email, memo, etc.), organizational charts, meeting minutes, etc.

The Detailed Gap Analysis Tool (available at: http://www.faa.gov/about/initiatives/sms/specifics_by_aviation_industry_type/air_operators/)

may be used to summarize the results of the detailed gap analysis and to record objective evidence; however the company may elect their own method of recording.

c. Gap analyses (preliminary & detailed) should cover the entire set of functions, processes, and organizational departments in the service provider to be covered by the SMS. As a minimum, the Gap Analyses should cover all of the operational processes listed in the SMS Framework, Component 1.0 b (1) (a) or (b), as appropriate. The Detailed Gap Analyses should be continuously updated as the service provider progresses through the SMS implementation process.

d. Preliminary Gap Analysis: (On next page)

Preliminary Gap Analysis and Assessment

Certificate Holder: **Location:**

Component 1.0 Safety Policy and Objectives
Part 5 Subpart B

Policy: General Expectations
SRR(R)[15]: §5.23 (Operational Management), §5.25 (Accountable Executive, Management Representative/Director of Safety)
SRR(P)[16]: §5.21 (Safety Policy), §5.95 (SMS Documentation)

Performance Objective

The organization will develop and implement an integrated, comprehensive SMS for its entire organization and will incorporate procedures to identify and maintain compliance with current safety-related legal, regulatory, and statutory requirements.

Element 1.1 Safety Policy
SRR(R): §5.25 (Accountable Executive)
SRR(P): §5.21 (Safety Policy)

Performance Objective

Top management will define the organization's Safety Policy and convey its expectations and objectives to its employees.

Element 1.2 Management Commitment and Safety Accountabilities
SRR(R): §5.23 (Operational Management), §5.25 (Accountable Executive, Management Representative/Director of Safety)

Performance Objective

The organization will define, document, and communicate the safety roles, responsibilities, and authorities throughout its organization.

Element 1.3 Key Safety Personnel
SRR(R): §5.23 (All Management), §5.25 (Accountable Executive, Management Representative/Director of Safety), 119.65 (Required Management Personnel)

Performance Objective

The organization will appoint a management representative to manage, monitor and coordinate the SMS processes throughout its organization.

---

[15] SRR(R) refers to regulatory requirement for *management responsibility* for the component, element, or process

[16] SRR(P) refers to the regulatory requirement for the *process* associated with the component, element, or process. Note that 14 CFR § 5.95(b) requires the Certificate holder to document SMS processes and procedures.

Element 1.4 Emergency Preparedness and Response
SRR(R): Certificate Holder
SRR(P): §5.21 (a) (6), §5.27 (Coordination of emergency response planning)

Performance Objective

The organization will develop and implement procedures that it will follow in the event of an accident, incident or operational emergency to mitigate the effects of these events.

Element 1.5 SMS Documentation and Records
SRR(R): §5.25 (Designation and responsibilities of required safety management personnel)
SRR(P): §5.95, §5.97

Performance Objective

The organization will have documented safety policies, objectives, procedures, a document/record management process, and a management plan that meet organizational safety expectations and objectives.

Component 2.0 Safety Risk Management
Part 5 Subpart C

Safety Risk Management: General Expectations
SRR(R): §5.23 (Operational Management), §5.25 (Accountable Executive, Management Representative/Director of Safety)
SRR(P): §5.51, §5.53. §5.55, §5.73

Performance Objective

The organization will develop processes to understand the critical characteristics of its systems and operational environment and apply this knowledge to identify hazards, analyze and assess risk and design risk controls.

Element 2.1 System Analysis and Hazard Identification:
SRR(R): §5.23 (Operational Management), §5.25 (Management Representative/Director of Safety)
SRR(P): §5.53

Performance Objective

The organization will develop and maintain a process that ensures that hazards in operations are identified. Hazards will be identified from the analysis of critical design and performance factors, processes, and activities in sufficient detail to determine associated level of risk and risk acceptability.

Process 2.1.1 System Description and Task Analysis
SRR(R): Certificate Holder
SRR(P): §5.53 (a) & (b)

Performance Objectives

The organization will describe and analyze its systems, operations, and operational environment to gain an understanding of critical design and performance factors, processes, and activities to identify hazards.

Process 2.1.2 Identify Hazards
SRR(R): §5.23 (a) (2) (i), §5.25 (c) (1)

SRR(P): §5.53 (c)

Performance Objective

The organization will identify and document the hazards in its operations that are likely to cause death, serious physical harm, or damage to equipment or property in sufficient detail to determine associated level of risk and risk acceptability

Element 2.2 Risk Assessment and Control

SRR(R): §5.23 (Operational Management), §5.25 (Management Representative/Director of Safety)
SRR(P): §5.55

Performance Objective

The organization will develop and maintain a process that ensures analysis, assessment, and control of the safety risks in system operations.

Process 2.2.1 Analyze Safety Risk

SRR(R): §5.25 (c) (1)
SRR(P): §5.55 (a)

Performance Objective

The organization will determine and analyze the severity and likelihood of potential events associated with identified hazards and will identify risk factors associated with unacceptable levels of severity or likelihood.

Process 2.2.2 Assess Safety Risk

SRR(R): §5.23 (a) (2) (i), §5.23 (b)
SRR(P): §5.55 (b)

Performance Objective

The organization will assess risk associated with each identified hazard and define risk acceptance procedures and levels of management that can make safety risk acceptance decisions.

Process 2.2.3 Control/Mitigate Safety Risk

SRR(R): §5.25 (a) (4)
SRR(P): §5.55 (c)

Performance Objective

The organization will design and implement a risk control for each identified hazard for which there is an unacceptable risk, to reduce risk to acceptable levels. The residual or substitute risk will be analyzed before implementing any risk control.

Component 3: Safety Assurance

Part 5 Subpart D

Safety Assurance: General Expectations

SRR(R): §5.23 (Operational Management), §5.25 (Accountable Executive, Management Representative/Director of Safety)
SRR(P): §5.71, §5.73, §5.75

Performance Objective

The organization will monitor, measure, and evaluate the performance of their systems to identify new hazards, measure the effectiveness of risk controls, (to include preventative and corrective actions) and ensure compliance with regulatory requirements.

Element 3.1 Safety Performance Monitoring and Measurement:

SRR(R): §5.23 (Operational Management), §5.25 (Management Representative/Director of Safety)
SRR(P): §5.71

Performance Objective

The organization will develop and maintain a means to monitor, measure, and verify the safety performance of the organization, and to validate the effectiveness of safety risks controls.

Process 3.1.1 Continuous Monitoring

SRR(R): §5.23 (a) (2) (ii), §5.25 (c) (2)
SRR(P): §5.71 (a) (1)

Performance Objective

The organization will monitor operational data, including products and services received from contractors, to identify hazards, measure the effectiveness of safety risk controls, and assess system performance.

Process 3.1.2 Internal Audits by Operational Departments

SRR(R): §5.23 (a) (2) (ii)
SRR(P): §5.71 (a) (3), 121.373 (maintenance & inspection Programs)

Performance Objective

The organization will perform regularly scheduled internal audits of its operational processes, including those performed by contractors, to verify safety performance and evaluate the effectiveness of safety risk controls.

Process 3.1.3 Internal Evaluation

SRR(R): §5.25 (c) (2) & (4)
SRR(P): §5.71 (a) (4)

Performance Objective

The organization will conduct internal evaluations of the SMS and operational processes at planned intervals to determine that the SMS conforms to its objectives and expectations.

Process 3.1.4 External Auditing of the SMS

SRR(R): Not required
SRR(P): §5.71 (b)

Performance Objective

The organization will include the results of assessments performed by oversight organizations (FAA), and other organizations (IOSA, IS-BAO, etc.), in its analysis of data.

Process 3.1.5 Investigation

SRR(R): Certificate Holder
SRR(P): §5.71 (a) (5) & (6)

Performance Objective

The organization will establish procedures to collect data and investigate incidents, accidents, and instances of potential regulatory non-compliance to identify potential new hazards or risk control failures.

Process 3.1.6 Employee Reporting and Feedback System

SRR(R): §5.21 (a) (4) & (5), §5.25 (b) (2)
SRR(P): §5.71 (a) (7)

Performance Objective

The organization will establish and maintain a confidential employee safety reporting and feedback system. Data obtained from this system will be monitored to identify emerging hazards and to assess performance of risk controls in the operational systems.

Process 3.1.7 Analysis of Data

SRR(R): (As required per data source)
SRR(P): §5.71 (b)

Performance Objective

The organization will analyze the data gathered in the Data Acquisition Processes, to assess the risk controls' performance and effectiveness of risk controls in the organization's operational processes and the SMS, and to identify root causes of deficiencies and potential new hazards.

Process 3.1.8 System Assessment

SRR(R): §5.23 (a) (2) (ii), §5.25 (b) (5), §5.73 (a)
SRR(P): §5.73

Performance Objective

The organization will perform an assessment of the safety performance and effectiveness of risk controls, conformance to SMS expectations as stated herein, and the objectives of the safety policy.

Element 3.2 Management of Change

SRR(R): §5.23 (a) (2) (ii) (Operational Management)
SRR(P): §5.51, §5.73 (a) (4) & (5), §5.73 (b), §5.75

Performance Objective

The organization's management will develop and maintain a process to identify changes within the organization or its operational environment which may affect established processes and services. This process will be used and to describe the arrangements to assure safety performance before implementing changes.

Element 3.3 Continuous Improvement

SRR(R): §5.23 (Operational Management), §5.25 (Accountable Executive)
SRR(P): §5.75, §5.97

Performance Objective

The organization will develop and maintain a process to identify the causes of sub-standard safety performance, determine the implications of substandard safety performance, and eliminate or mitigate

such causes.

Process 3.3.1 Preventive/Corrective Action
SRR(R): §5.23 (a) (2) (ii), §5.25 (b) (5)
SRR(P): §5.75, §5.97

Performance Objective

The organization will take corrective and preventive action to eliminate the causes, or potential causes of nonconformance identified during analysis, to prevent recurrence.

Process 3.3.2 Management Review
SRR(R): §5.25(b)(5)
SRR(P): §5.73(a)

Performance Objective

The accountable executive will conduct regular reviews of the SMS to assess the performance and effectiveness of the organization's operational processes and the need for improvements.

Component 4: Safety Promotion
Part 5 Subpart E

Safety Promotion: General Expectations
SRR(R): §5.23 (a) (2) (iii) (Operational Management), §5.25 (b) (4) (Accountable Executive), §5.25 (c) (3) (Management Representative/Director of Safety)
SRR(P): §5.91, §5.93

Performance Objective

The management representative will promote the growth of a positive safety culture and communicate it throughout the organization.

Element 4.1 Competencies and Training
SRR(R): §5.23 (a) (2) (iii), §5.25 (b) (4), §5.25 (c) (3)
SRR(P): §5.91

Process 4.1.1 Personnel Expectations (Competence)
SRR(R): §5.23 (a) (2) (iii), §5.25 (b) (4), §5.25 (c) (3)
SRR(P): §5.91

Performance Objective

The organization will ensure that personnel are trained and competent to perform the SMS duties. The scope of safety training will be commensurate with the individual's involvement in the SMS.

Process 4.1.2 Training
SRR(R): §5.23 (a) (2) (iii), §5.25 (b) (4), §5.25 (c) (3)
SRR(P): §5.91

Performance Objective

The organization will develop, document, deliver and regularly evaluate training necessary to meet competency requirements outlined in their safety policy.

Element 4.2 Communication and Awareness
SRR(R): §5.23 (a) (2) (iii), §5.25 (b) (4), §5.25 (c) (3)
SRR(P): §5.93

Performance Objective

The management representative will communicate the output of its SMS to its employees, and will provide its oversight organization access to SMS outputs in accordance with established agreements and disclosure programs.